CHNOLOGY DEPARTMENT

THE PAPER INDUSTRY and PAPER WORLD

EDUCATIONAL NEWS MAGAZINE — JUNE, 1947

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IN PAPERMAKING
exact to specifications . . .

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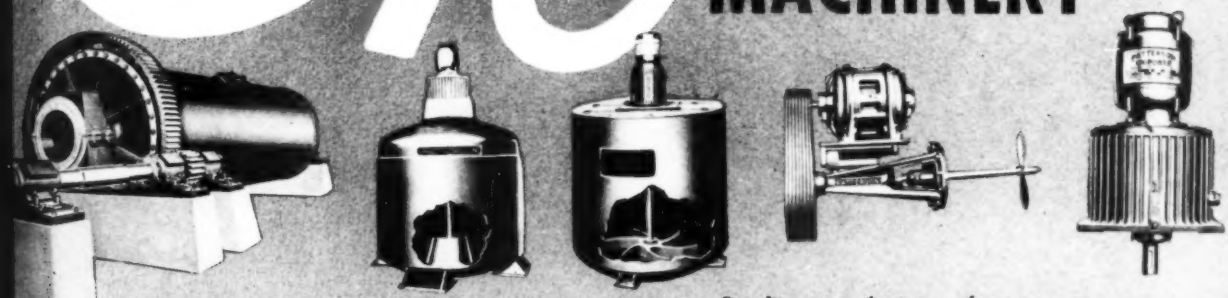


Patterson
INDUSTRIAL PATTERSON MACHINERY
EQUIPMENT HEADQUARTERS FOR THE PROCESSING INDUSTRIES
SINCE 1866

In the manufacture of paper, precisely matched to specifications, you profit by the *control* provided by Patterson Equipment — *where precision pays off!*

Richard L. Cameron
President

THE PATTERSON FOUNDRY & MACHINE CO.
EAST LIVERPOOL, OHIO, U.S.A.
IN CANADA
THE PATTERSON FOUNDRY & MACHINE CO. (CANADA) Ltd.
TORONTO, ONTARIO

NOW... A LINE OF PAPER CUTTERS WITH

Simple, Quick Knife Adjustment

SIMPLE, QUICK KNIFE ADJUSTMENT: A turn of the knurled collar on pull bar adjusts knife to cutting stick. No tools are necessary. Self-locking. Adjusts to the thickness of one sheet.

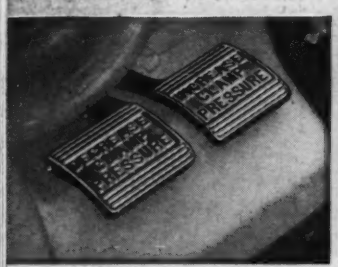
That's why Trimming is SPEEDIER... CLEANER WITH A Seybold "Sixty"

Simple, quick knife adjustment is just one more reason why mill trimmer and spacer operators are saying of the new Seybold "Sixty"—"that's the machine for me".

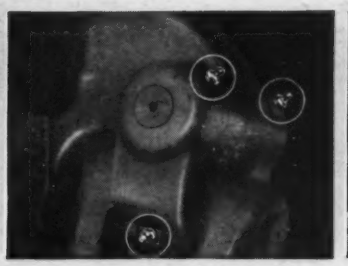
Recognizing that certain adjustments such as changing clamping pressure and resetting the knife, can never be eliminated, these and other tasks have been greatly simplified. The efficient, new line of Seybold "Sixty" Mill Trimmers and Spacers have been designed to conserve the operator's time and energy. In the long run, this spells greater productivity . . . greater tonnage.

Today, Seybold Mill Trimmers and Spacers are faster, safer and more accurate —are more efficiently lubricated and maintenance has all but disappeared.

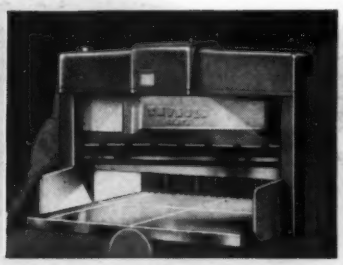
Get all the facts from your Harris-Seybold representative.



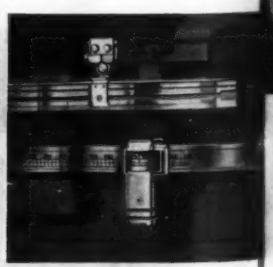
CONTROLLED BY FOOT PEDALS: A simple pumping motion changes clamping pressure instantly. No tools are needed. Saves time. Saves energy. A shadow gauge registers the pressure reading.



EASILY LUBRICATED: Zerk fittings are provided for cleaner, easier, more permanent lubrication. Lubrication points are out in the open, encouraging more thorough lubrication.



FLOODLIGHTED TABLE AND GAUGE—MAGNIFIED MEASURING BAND: Less operator fatigue. Greater safety. Less chance for errors. Greater production of more accurately trimmed work.



FASTER AUTO-SPACERS: Automatically moves stock into position at a faster rate than ever before. Cut stops can be set, at one time, to make all cuts necessary on several jobs.

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Harris-Seybold Company • General Sales Offices, Cleveland 5, Ohio

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Backed up by the world's largest and most highly-skilled, factory-trained paper cutter service organization.

Over 3,000 a day

In the core room, the meticulous planning of Beloit engineers takes shape in the form of parts for fine paper machines. Core makers at Beloit turn out an average of over 3,000 cores a day. These vary in weight from two ounces to more than eight tons. Above, loading cores for the core oven, is Fred Scudder, who has been with Beloit for a total of ten years. *Beloit Iron Works, Beloit, Wisconsin.*

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS. U.S.A.

WHEN YOU BUY BELOIT...YOU BUY MORE THAN A MACHINE!

BELOIT

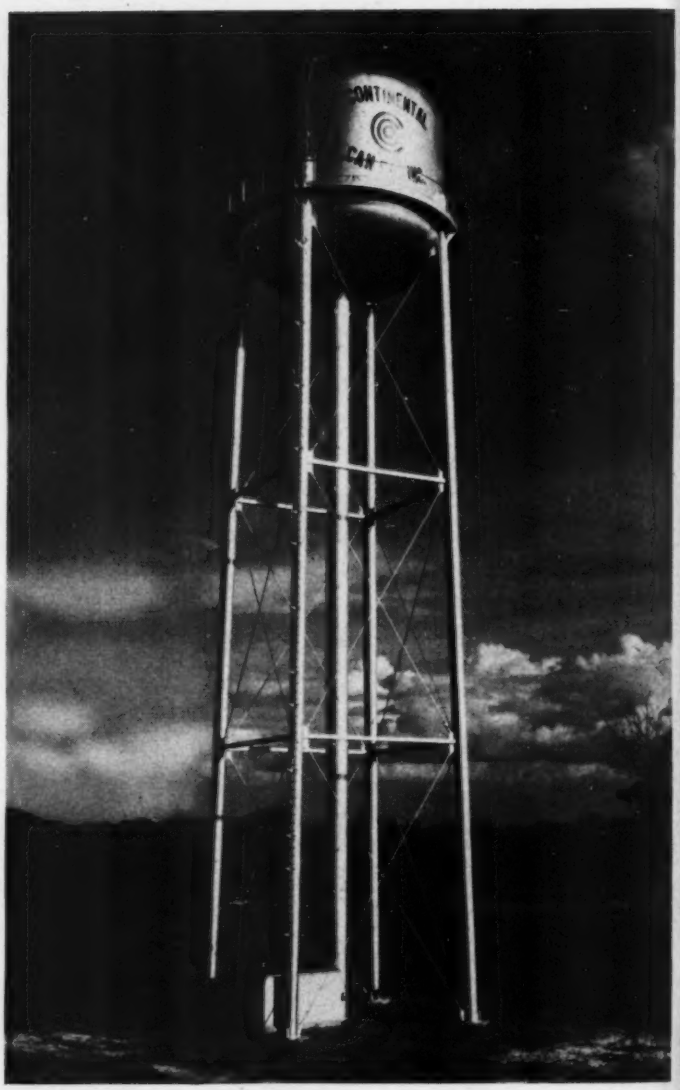
PAPER MACHINERY

GRAVITY WATER PRESSURE *Adds Dependability* TO AUTOMATIC SPRINKLER SYSTEMS

An automatic sprinkler system gives you the kind of fire protection you need for your mill. Automatic sprinklers are of little value, however, without adequate water pressure to *back them up*. Horton elevated storage tanks provide the kind of pressure you can depend upon *at all times*.

Elevated tanks can be used as the primary source of water, or as a secondary source to provide pressure when there is insufficient pressure in the mains to take care of the required load. In either case, you will have plenty of water available the instant a blaze breaks out.

Most installations for automatic sprinkler systems require a gravity supply of 50,000 gals. to 250,000 gals. Horton elevated tanks of welded construction are built in standard capacities as shown in the table at the right. If you are planning an automatic fire protection system, be sure to get the added dependability of *gravity* water pressure as provided by Horton elevated tanks. Write our nearest office for estimating figures.



The 100,000-gal. Horton elevated tank shown at the right provides gravity pressure for the automatic sprinkler system at one of the Continental Can Company plants. It is 100 ft. to bottom.

ELLIPSOIDAL-BOTTOM TANKS WITH CONE ROOFS

Capacity U. S. Gallons	Tank Dimensions		
	Diam.	Shell Height	Range of Head
50,000	22′–0″	14′–0″	19′-6″
60,000	24′-0″	14′-0″	20′-0″
75,000	36′-0″	14′-9″	21′-3″
100,000	28′-8″	16′-0″	23′-2″
125,000	30′-0″	18′–9″	26′–3″
150,000	32′-0″	19′–8″	27′–8″
200,000	36′-0″	20′-4″	29′-4″
250,000	40′-0″	20′-2″	30′-2″
300,000	42′-0″	22′-0″	32′-6″
400,000	46′-0″	24′-9″	36′–3″
500,000	50′–0″	25′-10″	38′–4″

Note: We can also furnish ellipsoidal-bottom tanks with cylindrical columns and ellipsoidal roofs.

HERE IS SOME OF THE EQUIPMENT WE DESIGN AND FABRICATE FOR PAPER AND PULP MILLS

- Sulphate Digesters
- Sulphite Digesters
- Diffusers
- Cookers
- Hortonspheres
- Flat-bottom Tanks
- Steel Smoke Stacks
- Salt Cake Bins
- Elevated Water Tanks
- Cylindrical Tanks

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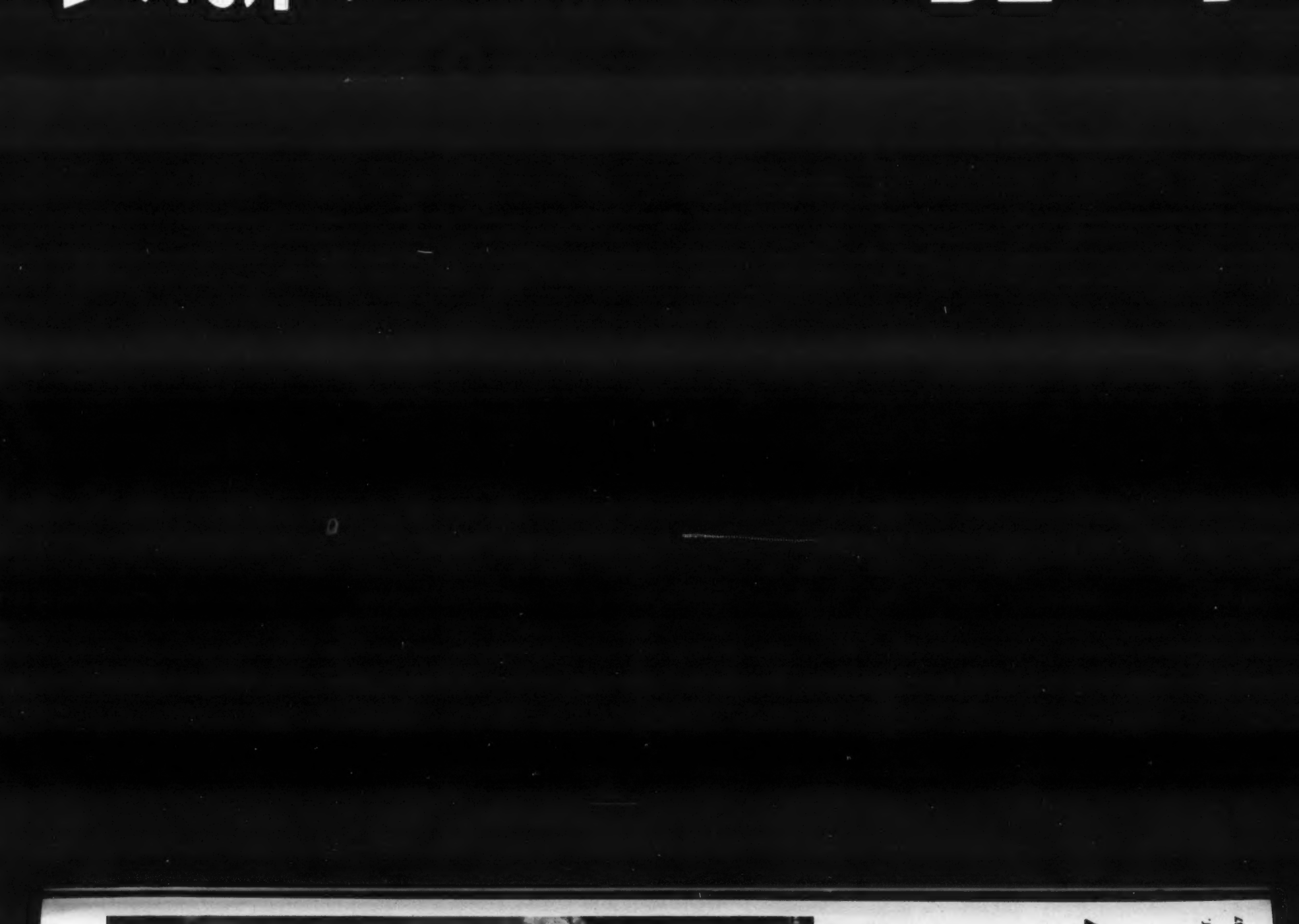
Tulsa, 3.....1651 Hunt Building
Houston, 1.....5643 Clinton Drive
Philadelphia, 3.....1653-1700 Walnut Street Building
Havana.....402 Abreu Building
San Francisco, 11.....1217-22 Battery Street Building
Detroit, 26.....1566 Lafayette Building

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNA.

In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.



Colors for Kraft

Du Pont Quinoline Yellow Concentrated
Du Pont Brilliant Paper Yellow Extra Concentrated 125%
Du Pont Brilliant Crocein FL Extra Concentrated
Du Pont Anthraquinone Blue BN
Du Pont Nigrosine WSB Concentrated Powder
Pontamine* Fast Red 8BL Concentrated 125%

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A wide range of shades . . . these colors for Kraft can be used singly or in combination with one another.

Good working properties . . . excellent solubility and dispersibility . . . proper light fastness. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

Du Pont Dyestuffs

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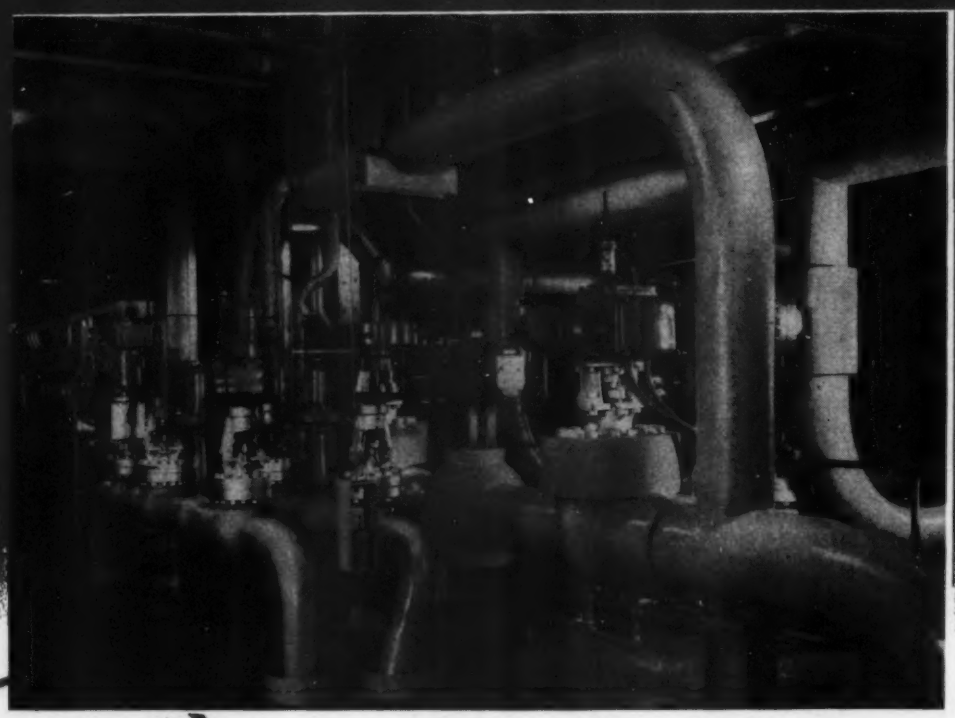
. . . THROUGH CHEMISTRY

DU PONT

Complete PIPING SYSTEMS



A JOB FOR AN EXPERT

Give us your blueprints—and quit worrying. Prefabrication by P. P. & E. will give you a complete piping installation that begins with the selection of the proper materials for the conditions to be met, and ends only when your power plant is completely erected and delivering power.

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There's a Pittsburgh Piping installation near you. Contact our nearest representative or write us for further information.

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AND EQUIPMENT COMPANY
10 Forty-Third Street — Pittsburgh, Penna.

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 29 - - - - - - JUNE, 1947 - - - - - - NUMBER 3

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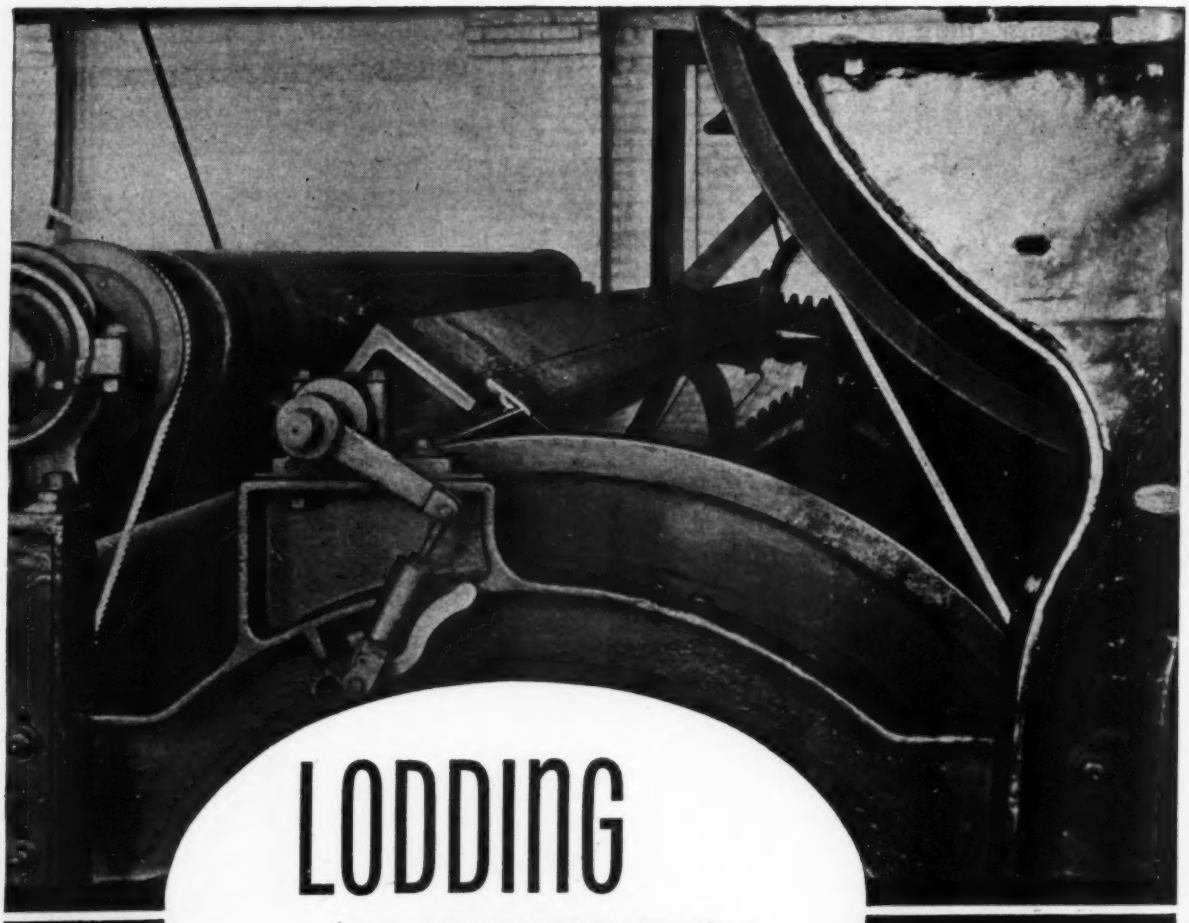

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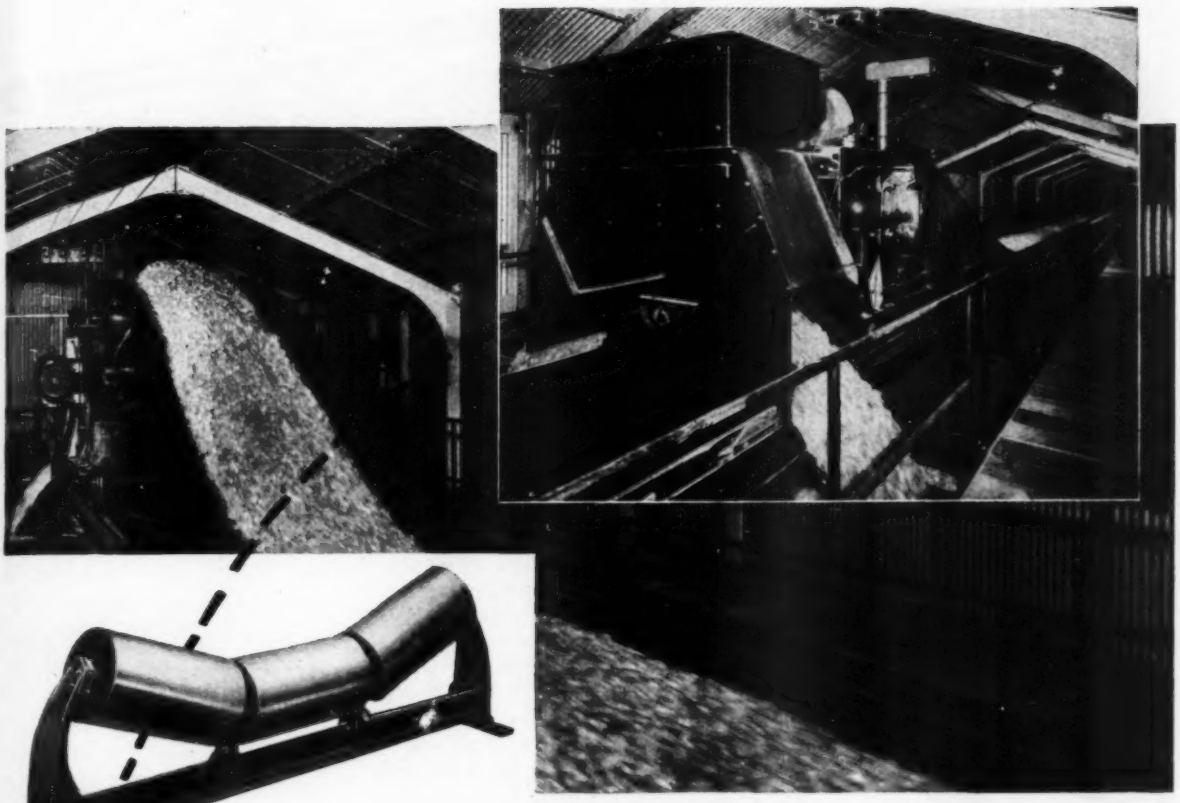

LINK-BELT provides *a Quick Trip for Every Chip!*

L-B BELT TRIPPER PLACES HUGE VOLUME OF CHIPS IN STORAGE AT SOUNDVIEW

Link-Belt troughing idlers and return idlers with sealed roller bearings engineered and manufactured by Link-Belt, provide long life, trouble-free, low-cost operation in this simple, widely-used form of conveyor.

Traveling 550 F.P.M., this 60 inch belt carries 72,000 cubic feet of wood chips over the Link-Belt tripper, and into the storage bin every hour. At the same time, the tripper moves about 30 F.P.M., distributing the chips along the length of the bin. Reversing switches at either end makes this movement entirely automatic, though a platform on the tripper permits an operator to ride on it if desired.

This device is the most recent Link-Belt installation in Soundview Pulp Co., the world's largest sulphite pulp plant, where numerous other belt conveyors, riding on Link-Belt roller bearing idlers, integrate the various stages in the process of converting wood chips into paper pulp.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities.

10,486

LINK-BELT

BELT CONVEYOR EQUIPMENT

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BY A WIDE MARGIN

OIC goes *beyond* the regular specifications to provide an extra margin of strength and durability in the valves you buy. For example, all pressure parts of OIC steel valves rated at 300-lbs. and above are cast not from ordinary carbon steel (which meets requirements) but from tougher carbon-molybdenum steel. That gives you *more* strength and safety over the full range of temperatures . . . at no additional cost!

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O-347-4

248 PAGES OF VALVE DATA

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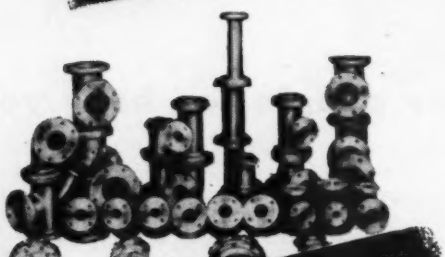
RESIST

CORROSION · ABRASION · HEAT

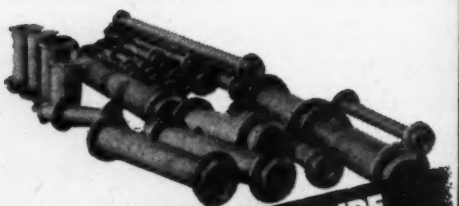
in the Paper Mill

with COOPER STAINLESS STEEL · · ·

CASTINGS



FITTINGS



CENTRIFUGAL PIPE

COOPER'S 25 Years of close association with the Paper Industry and its intimate knowledge of the problems peculiar to that industry . . . plus vast technical experience combined with practical shop skill has resulted in COOPER'S unusual ability to produce sound corrosion resisting Stainless Steel castings, fittings and centrifugal pipe specifically designed to resist corrosion, abrasion and heat in the Paper Mill.

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Whatever the use, the Oliver Ringvalve Filter offers these exclusive features:

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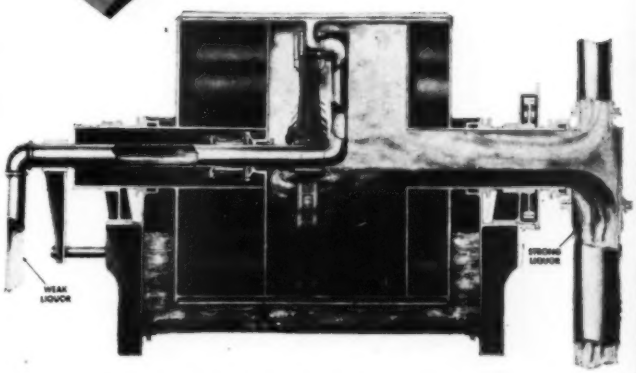
- low resistance to flow, assuring high hydraulic capacity and ability to handle peak loads
- simplicity and accessibility of the ringvalve; easily inspected
- operable by barometric leg
- uniform sheet and higher washing efficiency when used as a washer



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particularly where steam also is required for heating or process.

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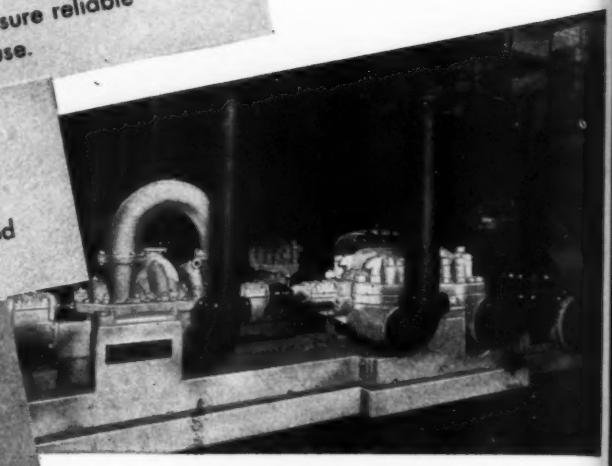
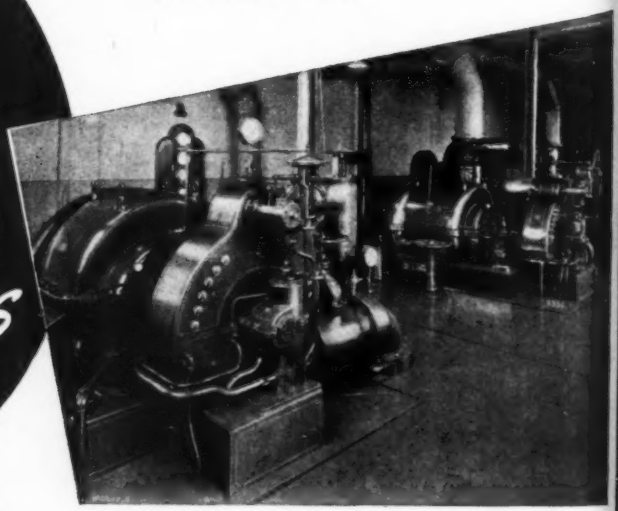


De Laval Class C Velocity Stage Turbine Driving De Laval Boiler Feed Pumps.

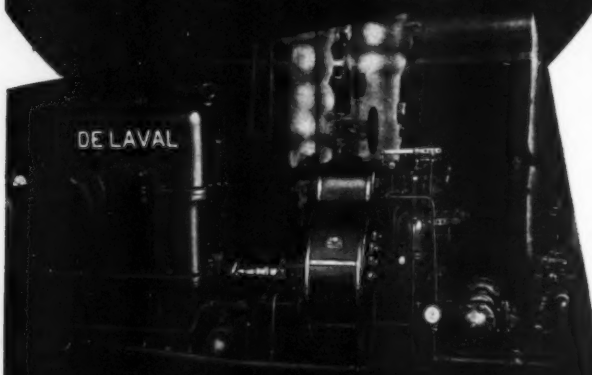
Install

DE LAVAL

SINGLE STAGE TURBINES



De Laval Centrifugal Compressor Driven by De Laval Velocity Stage Turbine. Exhaust Steam from the turbine is used in processes throughout the plant.



Paper Machine Driven by a 225 Horsepower De Laval Velocity Stage Turbine Through De Laval Worm Gear.

T-2

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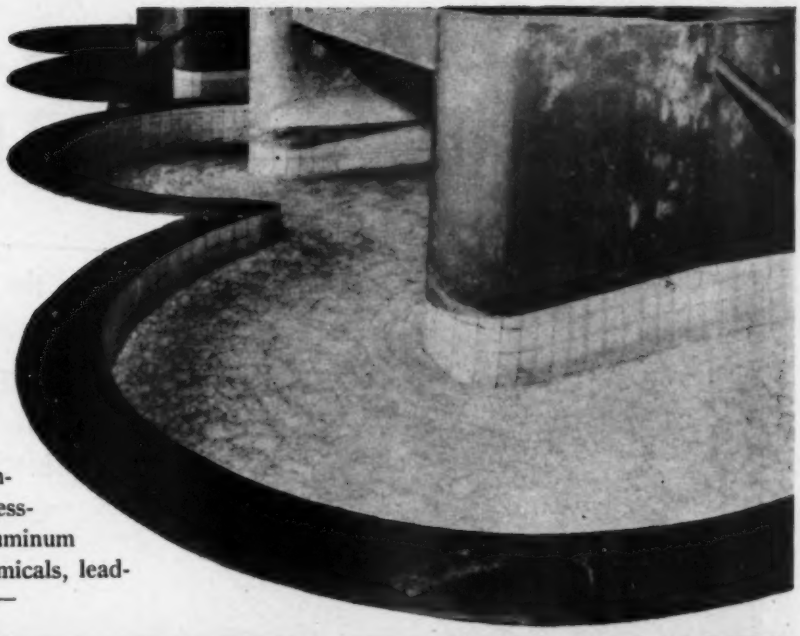
sizing



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- Salt Cake
- Sodium Sulfide
- Sodium Hyposulfite
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- Trisodium Phosphate
- Tetrasodium Pyrophosphate
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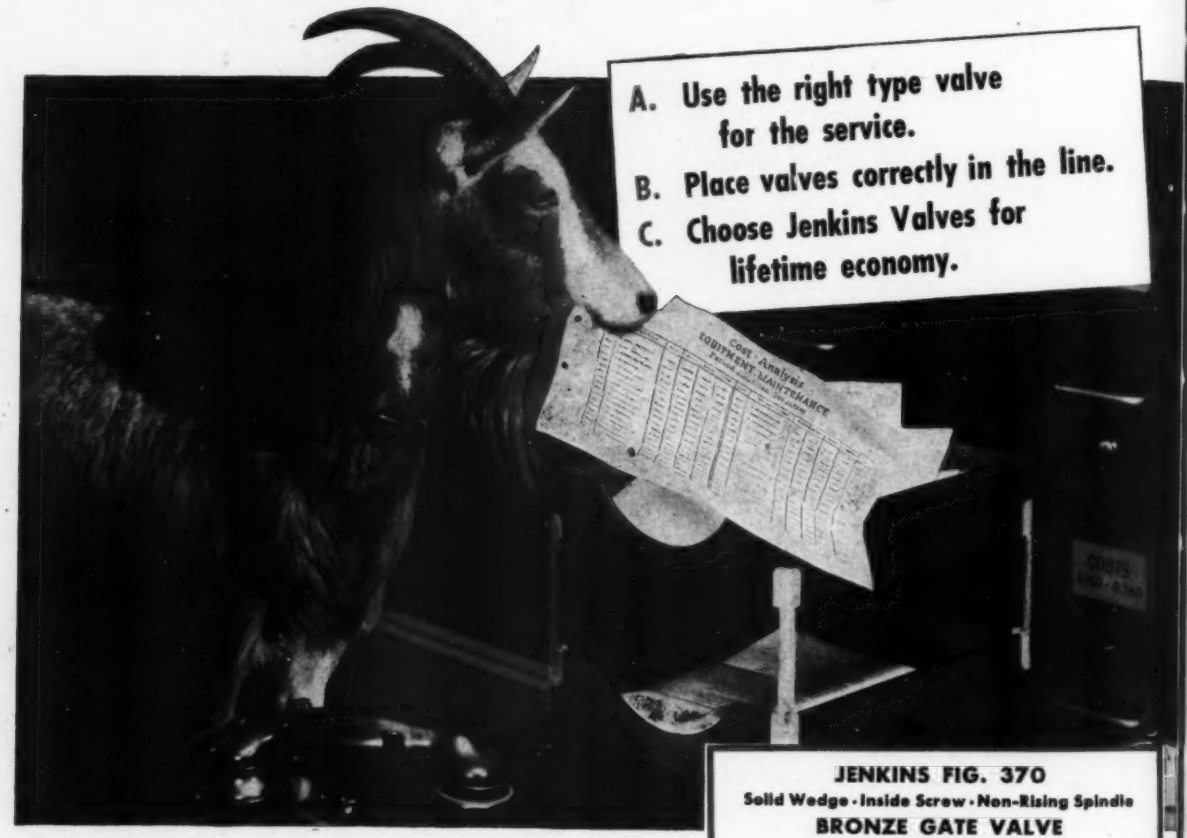
BASIC CHEMICALS
GENERAL CHEMICAL COMPANY
FOR AMERICAN INDUSTRY

Today's Maintenance Costs Ain't Hay . . . follow this Formula and keep 'em down


A. Use the right type valve for the service.
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WITH THIS SIMPLE ABC formula, you can avoid needless valve maintenance costs . . . thereby aid management in its drive for economy. Records of thousands of valve users prove that it works.

By choosing Jenkins Valves, and treating them with reasonable care, you'll find that they'll serve far beyond the normal life expectancy of valves, even under hard and constant usage. What's more, you can call on Jenkins Valve Specialists for any help you need in selection and placement of valves for greatest efficiency.

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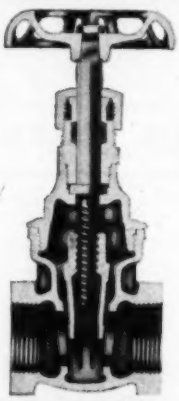
Types, Sizes, Pressures, Metals for Every Need

Sold Through Reliable Industrial Distributors Everywhere

JENKINS FIG. 370

Solid Wedge · Inside Screw · Non-Rising Spindle

BRONZE GATE VALVE



125 lbs. Steam

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This valve gives dependable service where full, free, unobstructed flow is required. For steam service especially, the solid wedge affords maximum resistance to pressure strains. Wedge design provides full thread engagement when valve is closed. When valve is fully opened, wedge entirely clears pathway. Extra stamina for extra service — spindle metal has tensile strength of 55,000 lbs. p.s.i.

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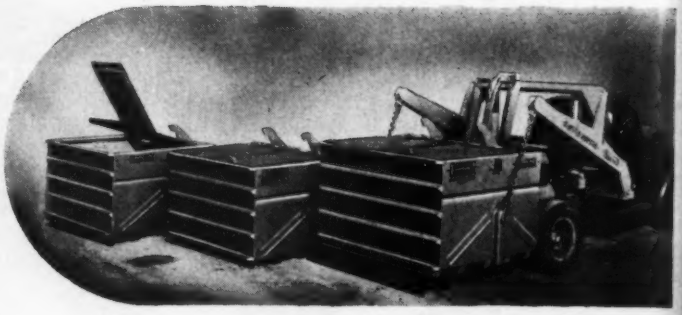
ONE TRUCK SERVES 20 BODIES IN THIS PLANT



Another Dempster Development For Industrial Materials Handling

★ Another typical example of how the Dempster-Dumpster is saving time, manpower, trucks, tires, and gas in leading industrial plants of almost every classification.

In this case, twenty standard Dempster-Dumpster drop-bottom bodies of 6 cu. yd. capacity each, equipped with special twin, self-balancing, spring hinged lids, are spotted throughout one of America's leading factories. A few are placed in convenient spots for receiving waste and rubbish. Others are placed at strategic points for recovering metal shavings. As each body is filled, forked truck conveys loaded body to convenient point where truck, equipped with the Dempster-Dumpster Hoisting unit, hoists load to carrying position, and dumps it at delivery point, all under full control from driver's seat. When empty body is returned, another loaded one, perhaps with a different type of material, is there for hauling and dumping . . . an uninterrupted cycle of materials handling using twenty bodies but with only one truck.

In dozens of other plants, various types of bodies are in use handling materials of almost every description from dust to liquid . . . light to heavy up to 7½ tons pay load . . . finished and unfinished products . . . hot materials up to 1500 degrees F . . . and in every operation with one truck serving from 6 to 50 bodies.

The chances are that the advantages of the Dempster-Dumpster can and should be adapted to your plant. Let our engineers cooperate with you. Write for our complete catalog No. 247 now.

Illustrations on this page tell the operating story of the Dempster-Dumpster.

Top right shows a loaded body ready for hoisting. Shown also in this photo is the special twin, self-balancing, spring hinged tops on this particular body.

Center Photo shows loaded body in carrying position.

Bottom Photo illustrates instant, or controlled, dumping method of the Dempster-Dumpster bottom dumping type of body.

Types of bodies available are unlimited. Your requirements determine the design. Cooperation of our engineers with those of the customer has corrected hundreds of materials handling problems and at tremendous savings.

CATALOG

write for it

TODAY

Sectional Drawing and Description of Sutherland Refiner Construction

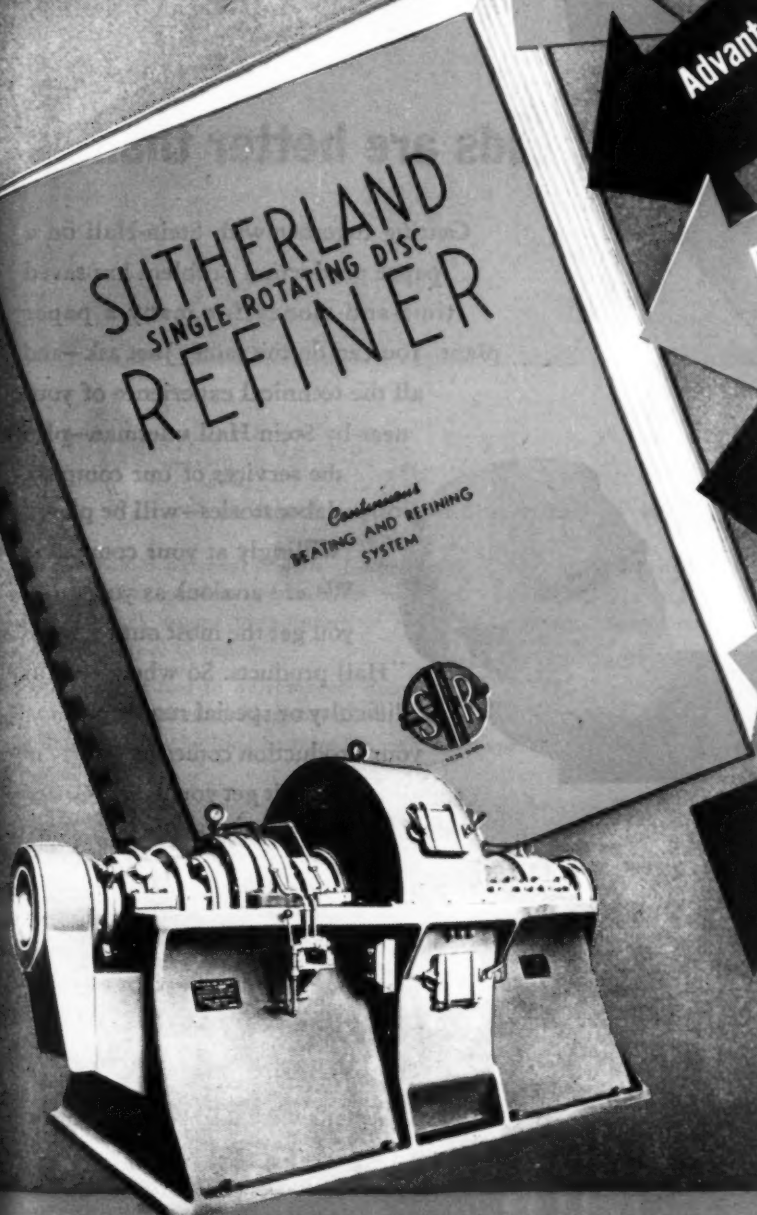
Advantages and Applications of Sutherland Continuous Beating and Refining

Engineering drawings of single and multiple refiner installations

Review of refining results in mills making various grades

Description of Principle and Method of Operation

Photos of all sizes of Sutherland Refiners, dimensions, weights

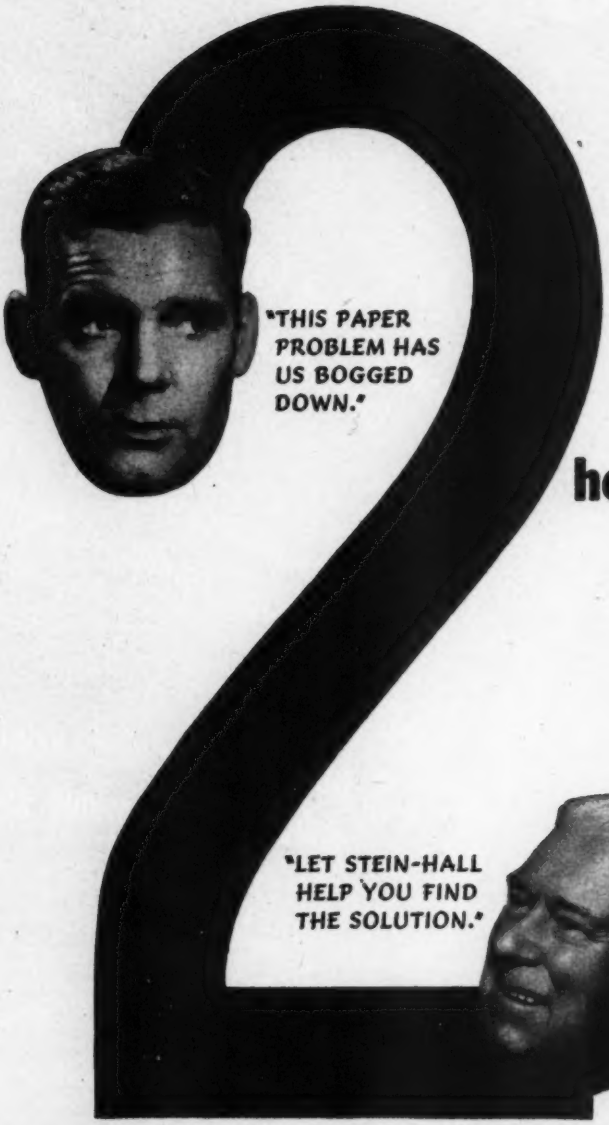


SUTHERLAND REFINER CORPORATION

1103 BROAD STREET BANK BUILDING • TRENTON, NEW JERSEY

Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL, P. Q. • Manufactured in Canada by The John Bertram & Sons Co. Ltd., Dundas, Ontario



2 heads are better than 1

Getting together with Stein-Hall on a paper production problem has saved time-and-money for many a paper plant. You can do the same. Just ask—and all the technical experience of your near-by Stein-Hall salesman—plus the services of our complete laboratories—will be placed willingly at your command. We are anxious as you to see you get the most out of Stein-Hall products. So whenever any difficulty or special requirement in your production comes up—large or small—don't let it get you down. Call in Stein-Hall right away.

HALLMARK QUALITY PRODUCTS FOR THE PAPER INDUSTRY

Corn Starches	Tapioca Flours	Beater Sizes
Calender Sizes	Tub Sizes	Coating Gums
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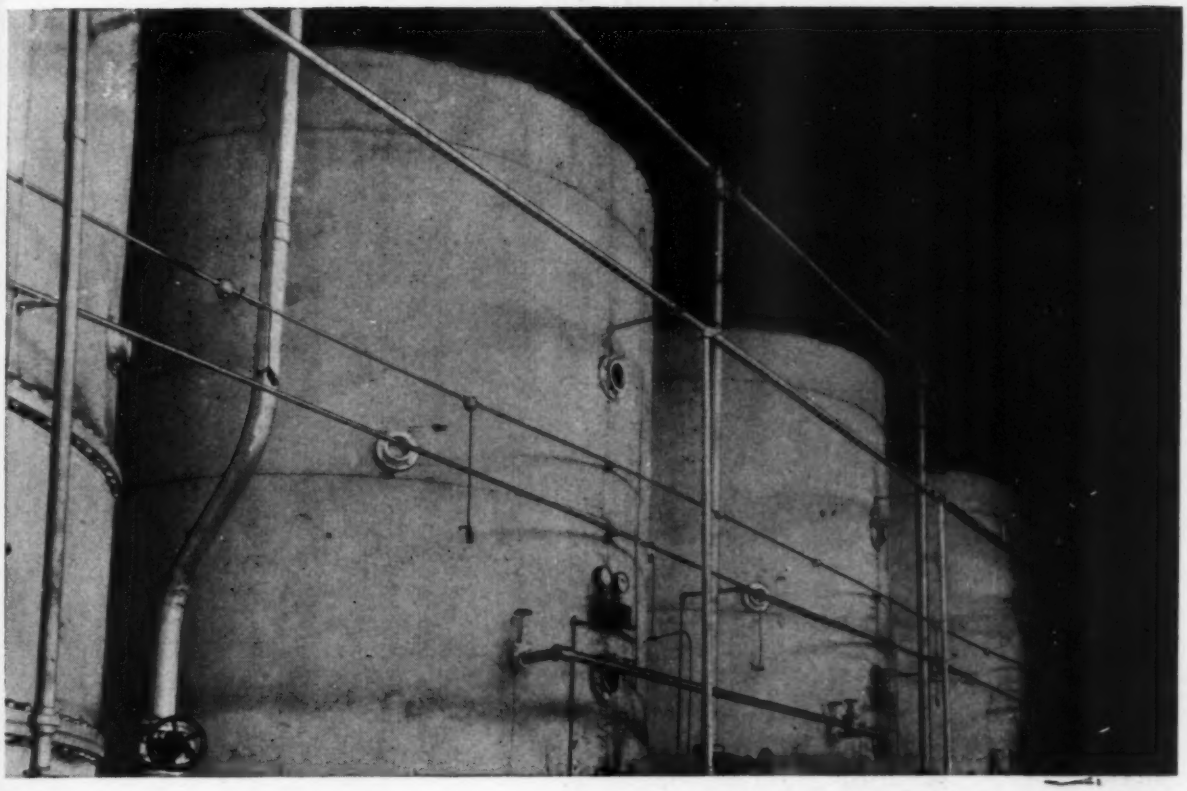


Timken tubes lasted 6 times as long—

In black liquor evaporators of West Virginia paper mill

From two to six times the life of other tubes! That's the service record of Timken seamless tubes of 5% nickel steel in black liquor evaporators of the West Virginia Pulp and Paper Company.

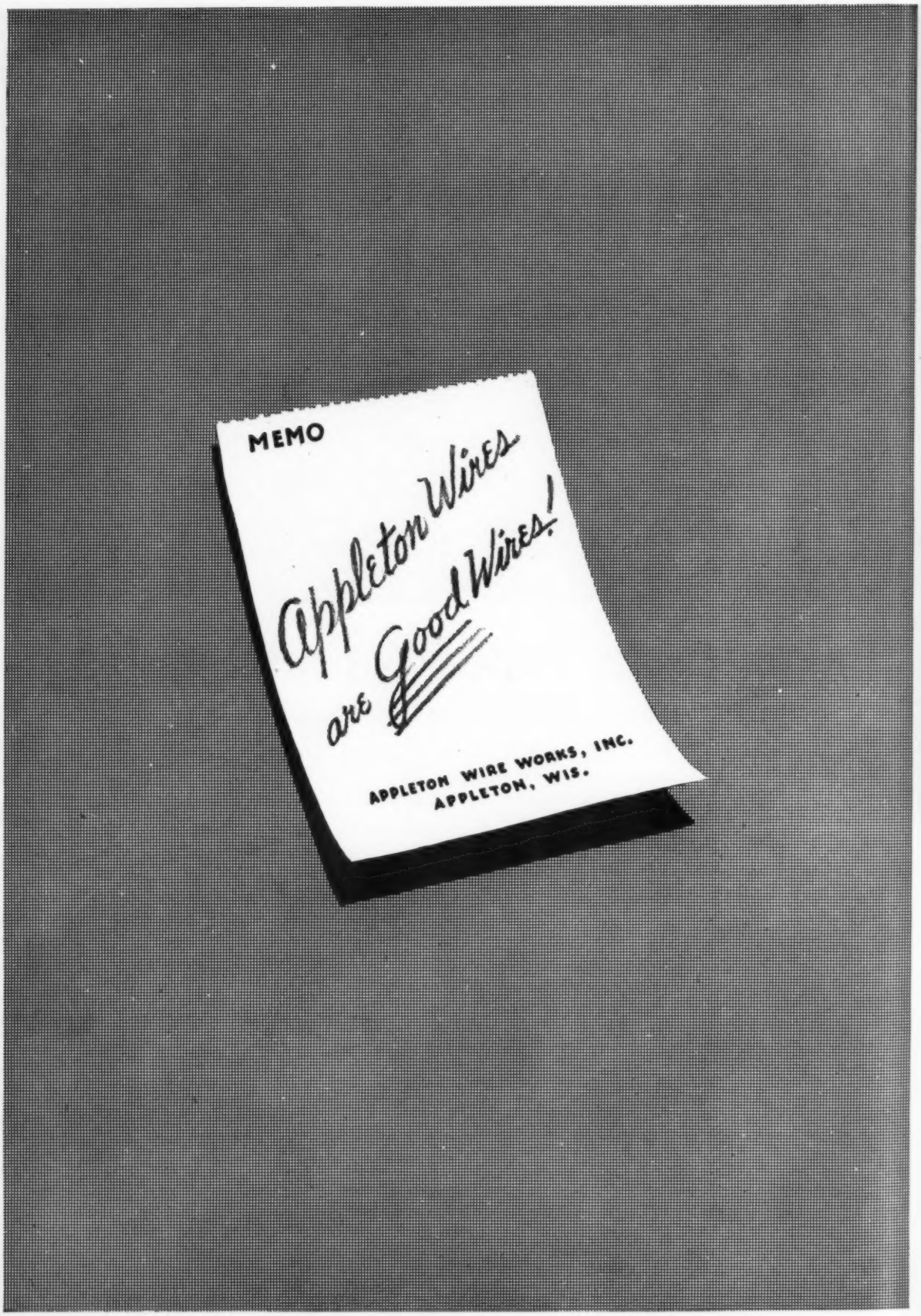
Other tubes had to be replaced after 6 months to 1½ years' use. But Timken Seamless Tubes gave good service for *3 full years*—the longest tube life ever obtained!

Reduced down time . . . substantial savings in tube costs . . . urgent schedules met on time—these are the results when you use corrosion resistant Timken 5% nickel steel tubes!

You should be enjoying the benefits of Timken experience in steel application in the process industries. A skilled Timken Specialist will be glad to help you select the proper steel for your corrosion or high temperature problems. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.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Appleton Wires are Good Wires!
APPLETON WIRE WORKS, INC.
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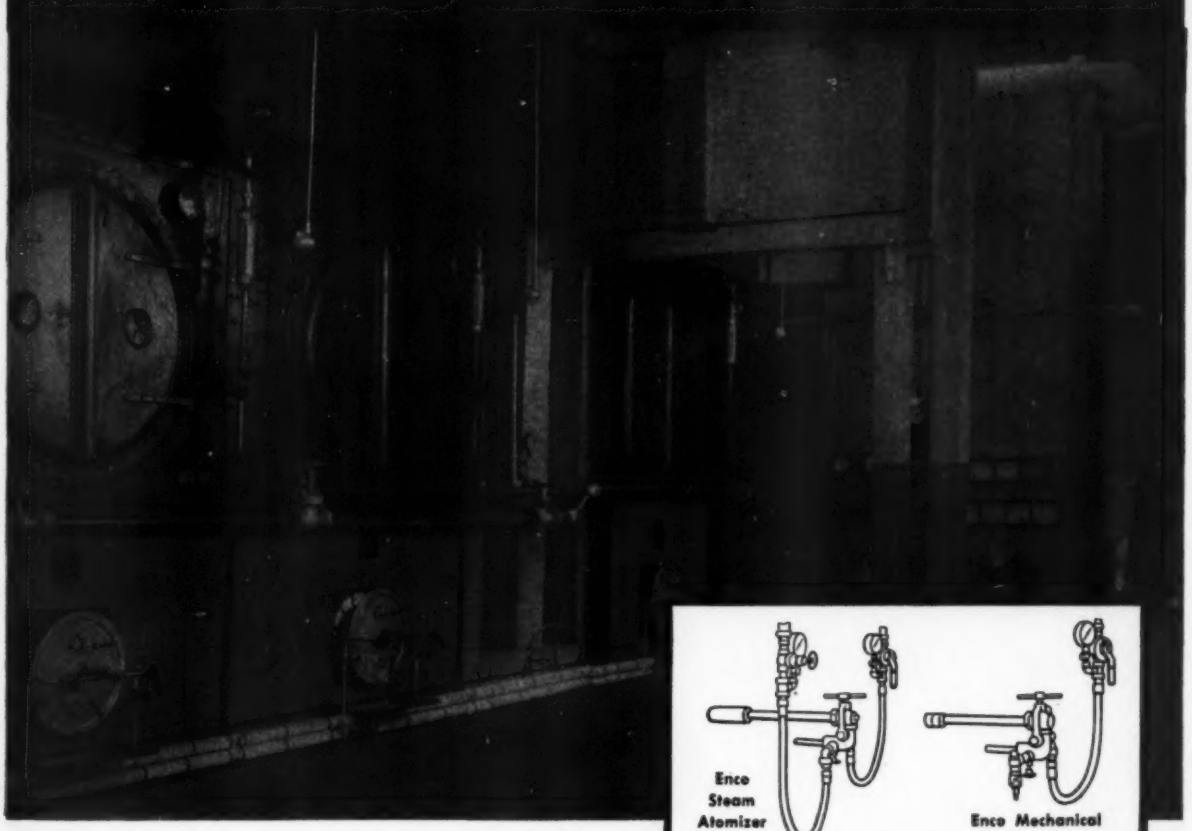
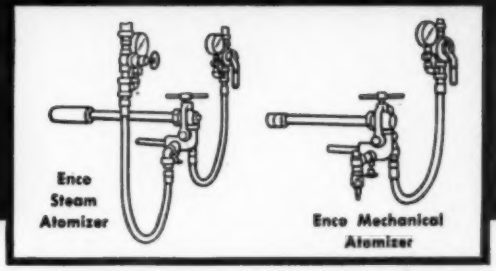
Swinging Load Demands are Easily Met with ENCO OIL BURNERS





In power plants where steam demands swing from high peaks to low loads over short periods, burner tip changes often become a nuisance to the engineer . . . and a source of man-hour loss which soon shows up in over-all cost figures.

With Enco Wide Range Atomizers, this frequent changing of burner tips is eliminated.

Used with all grades of liquid fuels, Enco Atomizers are designed for instant change of guns for operation with either steam or mechanical system. They are made in various sizes with capacities from 10 to 1,000 gallons per hour.

Enco Atomizers are often used with various types of pulverized coal and gas-burning equipment to provide a dual fuel unit for cold starting, or for full-load operation, when other fuels are unavailable or are less economical than oil.

For 30 years, Enco Burners have been leading the way to more efficient, more economical boiler operation. Write today for further information, or see your local Enco Representative.

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Also Produces

Enco Streamline Baffles
Enco Oil and Gas Burning Equipment
Enco Fuel Oil Pumping and Heating Units
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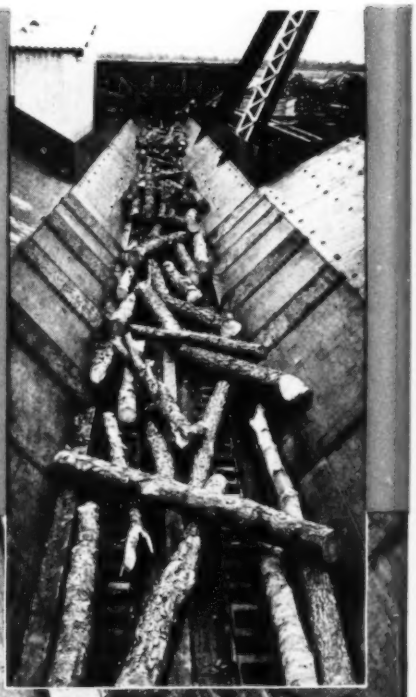
. . . . for BETTER PULPWOOD HANDLING

The Pulp and Paper Industry is just one in which the diversified line of Jeffrey equipment meets many handling requirements. Where pulpwood, rags, chips, salt cake, lime and sulphur, straw, pulp lap, paper rolls, packages of paper or board, etc., must be handled . . . there is a proper type of Jeffrey equipment to do the job efficiently and economically.

Jeffrey builds a complete line of material handling and reduction equipment for practically every industry. We will be glad to go into detail.



Large view shows a double-strand Jeffrey PW 132 Chain with S-212 Spurs, designed especially for log handling. This system provides a wide conveyor for large capacities and grab loading.

THE JEFFREY MANUFACTURING COMPANY

ESTABLISHED 1877

944-99 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

Baltimore 1 · Buffalo 2 · Cleveland 12 · Harlan · Jacksonville · Pittsburgh 22
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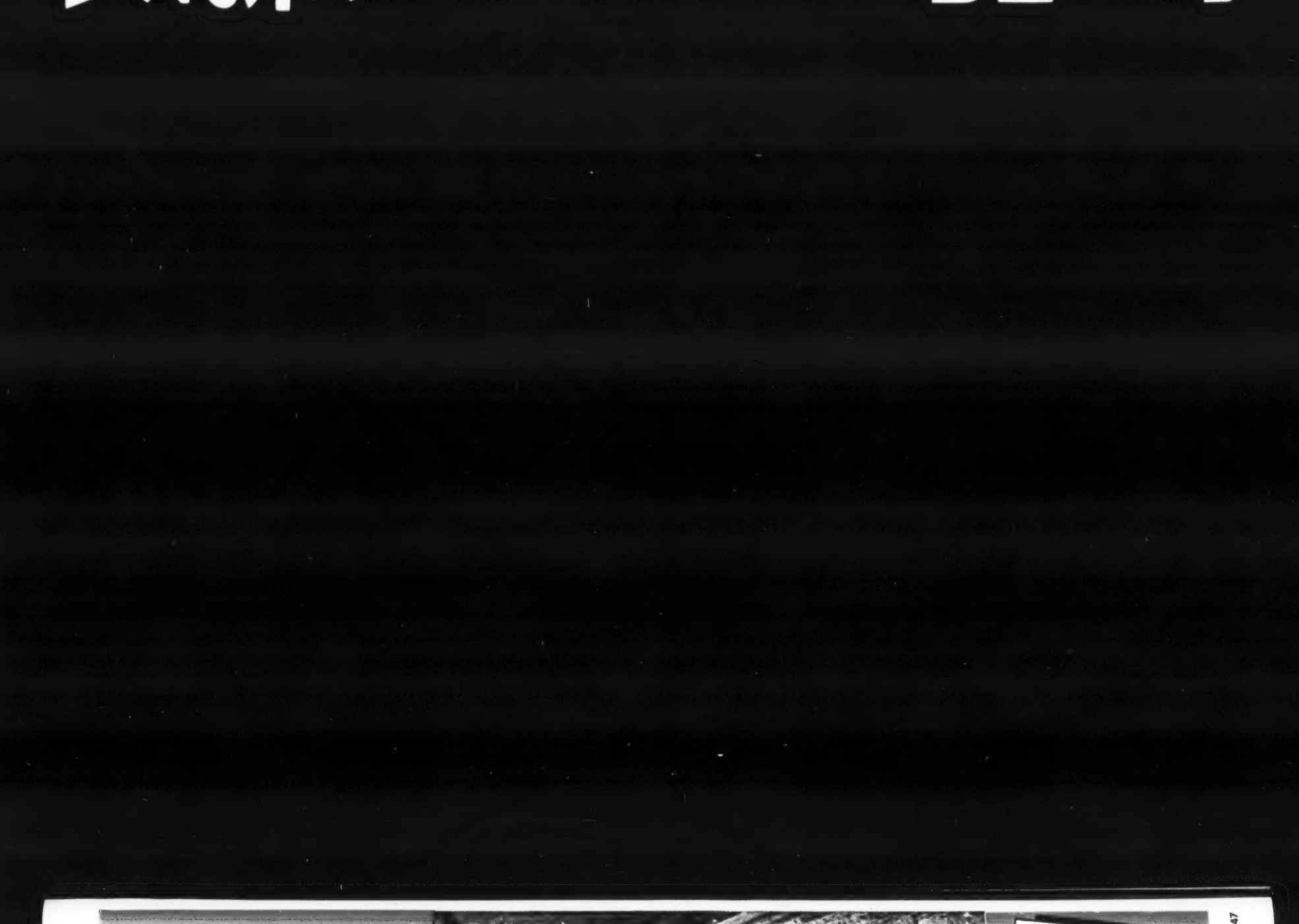


REDUCE SCREENING LOSSES AS MUCH AS 40% PER WEEK WITH CRODON PLATING

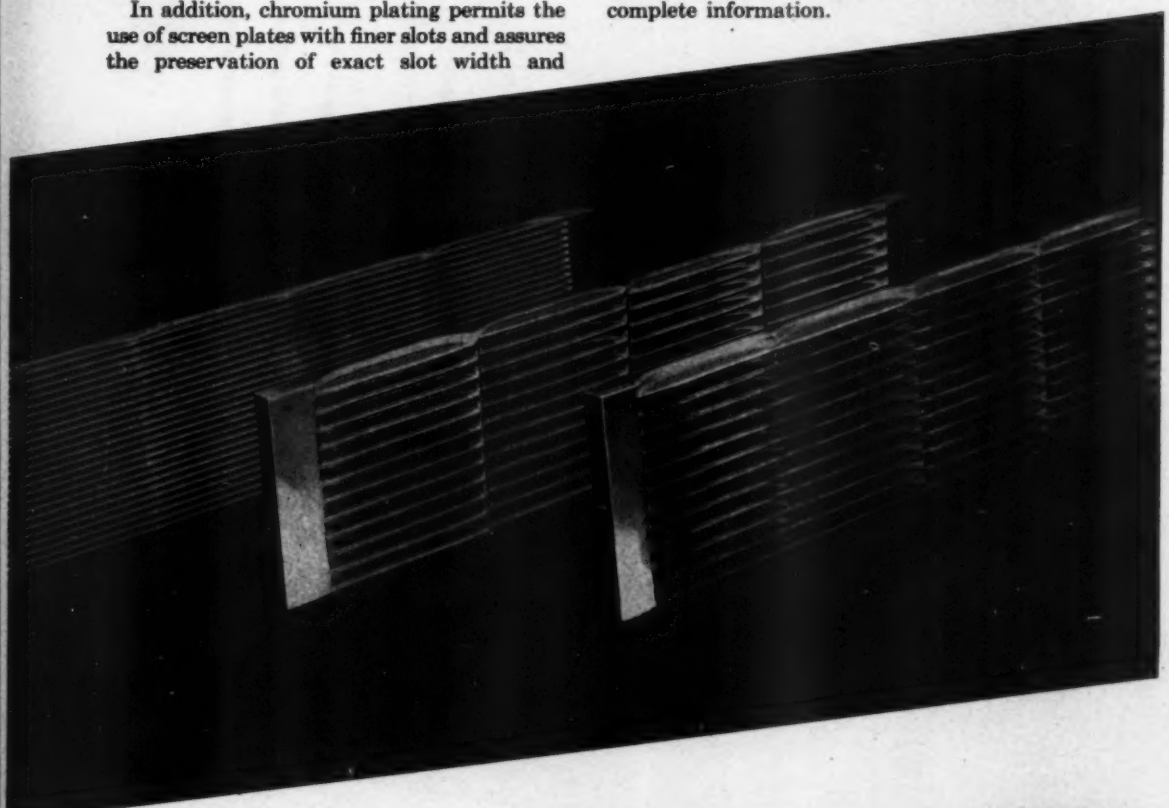
Take a *good* look at your screen plates. If you find them worn, rough and inaccurate... or with badly clogged slots causing heavy losses in screening capacity...you need the benefits of chromium plating.

The screen plates illustrated, for example, have been chromium plated and thus provided with a permanently hard, durable protection against wear and corrosion. The smooth, non-adherent properties of CRODON prevent the filling up or clogging of slots... known to cause losses in screening capacity as high as 40% in one week.

In addition, chromium plating permits the use of screen plates with finer slots and assures the preservation of exact slot width and smoothness. The results: greater production of a higher quality paper... fewer costly delays for cleaning or repairs.

NOW is the time to investigate how chromium plating can increase screening efficiency in your mill. One mill found that chromium-plated screen plates lasted four times as long as plain bronze plates.

By specifying CRODON when you chromium plate equipment, you are assured of the incorporation of all Chromium Corporation of America's skill and experience in electroplating technique. Write today for complete information.



CHROMIUM CORPORATION OF AMERICA

CRODON
The Chrome Plate

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Plant Trees . . . .
– but don't forget to
Protect our Forests!

947

TRADE WINDS

Where Are We in 1947?

▸▸▸ PRODUCTION for the first four months of 1947 was at an annual rate of 21,300,000 tons. If to this is added about 3,700,000 tons of imported newsprint; and adjustments are made for other imports and the probable 1947 exports, the estimated over-all consumption will be close to 25,000,000 tons in 1947. On a per capita basis, this will be just over 350 pounds per capita or an increase in 1947 over 1946 of over 30 pounds per capita.

Pulpwood

No single factor, but a combination of factors, has been responsible for the marked increase in pulpwood receipts this first quarter over the first quarter last year. Labor is in ample supply, new mechanical equipment is being made available in increasing quantity, and generally, good weather has been experienced throughout the country, especially in the South. These three favorable conditions have played important contributor roles in keeping domestic receipts above the demand level.

The freight car shortage is still much in evidence as reflected in the drop of 18 per cent in imports the first quarter of this year under first quarter 1946 shipments.

Pulpwood receipts for the first quarter of 1947 totaled 4,998,000 cords, an increase of 14 per cent above the comparable 1946 quarter. This increase in receipts was entirely domestic, up 18 per cent, imports having declined 18 per cent below the first quarter of 1946. Both the Northeast and Lake States Regions showed a decline in total receipts this first quarter in comparison to the same period last year.

The material published in this article has been excerpted from the April, 1947, issue of *Monthly Statistical Summary*, compiled and published by American Paper and Pulp Association, New York City.

The over-all increase in pulpwood consumption of 15 per cent the first three months of this year over the comparable 1946 period was reflected in each region, the largest increase coming in the South, 26 per cent, and the smallest in the Northeast, 1 per cent.

Inventories increased again due to high receipts. At the end of March, inventories reached a new record high of 4,082,000 cords, 31 per cent above the end of March, 1946. This improvement was spread throughout all of the five regions with the South continuing to show the greatest increase, 271 per cent.

Wood Pulp

First quarter 1947 production of wood pulp was approximately 2,927,000 short tons, 18 per cent above production in the comparable 1946 period. Imports of wood pulp from all sources totaled 469,292 short tons for the first three months of this year in comparison to 484,801 for the same period in 1946. Exports of wood pulp were 31,159 for the first quarter of this year in comparison to 7,162 tons for the like 1946 months. On the basis of this data, new supply of wood pulp for the first quarter was approximately 3,365,133 tons, in comparison to last year's first quarter new supply of 2,955,639 tons, an increase of 409,494 tons.

Wood pulp consumption reflected the greatly increased paper and board production in the first quarter. Consumption for the first three months of this year was 3,266,000 tons, an increase of 13 per cent over the comparable 1946 period.

Inventories at the end of March totaled 478,000 tons—395,000 tons at paper and paperboard mills and 83,000 tons at wood pulp mills. At the end of March last year, inventories totaled 651,000 tons—573,000 tons at paper and paperboard mills and 78,000 tons at wood pulp mills.

Wastepaper

Wastepaper supplies in most grades appear sufficient for mill needs, and more selective packing is now being stressed by consumer mills. The record paper and paperboard production attained in the first quarter and the continuing acute shortage of market pulp place greater emphasis on the need for keeping wastepaper supplies moving uninterruptedly to paper and board mills.

Receipts for the first quarter were 1,914,000 tons, an 8 per cent increase over first quarter 1946 collections. Consumption for the first three months was 1,983,000 tons, a 13 per cent increase over the like 1946 period. Inventories at the end of March were 443,000 tons, 31 per cent above inventories at the end of March, 1946.

Exports of wastepaper for the first three months of 1947 totaled 53,300 tons—15,653 tons of overissue news, 36,519 tons of other wastepaper, including old newspapers, and 1,128 tons of other paper stock.

LEFT—Champion board of directors (L to R)—Front row: L. C. Thomson, Harry G. Pounsford, and C. C. Benedict, of Cincinnati; Henry S. Bowers, of New York. Back row: H. W. Suter, Hamilton, Ohio; Dwight J. Thomson, Cincinnati; Herbert T. Randall, Hamilton; Reuben B. Robertson, Flat Rock, N. C.; John J. Rowe, Cincinnati, and Reuben B. Robertson, Jr., Cincinnati

BELOW—Suppliers of new paper machine equipment make inspection tour with Champion's Vice President Randall. Left to right: Andrew Spiegelhalter, president of Pusey & Jones Corp.; H. T. Randall, vice president of The Champion Paper and Fibre Co.; Chester H. Lang, vice president, General Electric Co.; and William Cronkhite, of the Industrial Sales Department of General Electric Co.

CHAMPION BOARD INSPECTS NEW FOURDRINIER AT CANTON

The board of directors of The Champion Paper and Fibre Company (Hamilton, Ohio) recently made its first official visit to the Canton (N. C.) Division of the company. Following a tour through the mill and grounds, the board held its meeting in Canton.

Occasion for the visit was inspection of the new paper machine recently installed in the Canton plant. This machine is a duplicate of one already in operation there; it is claimed to be the largest of its type making fine printing papers.

This new fourdrinier is part of Champion's expansion program now under way. Facilities also are being enlarged at the company's mills at Hamilton, Ohio, and Houston, Texas.

The directors were accompanied on their tour by officials of the companies supplying the new fourdrinier equipment.

◆

LOW POWER SUPPLY CURBS CONTINUOUS OPERATION OF WEST COAST MILLS

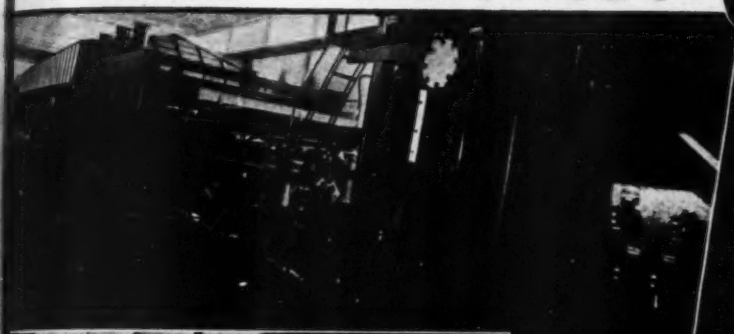
Some of the mills on the West Coast face a dire situation on account of inadequate power to insure continuous operation. In order to speed up a program for increased production of newsprint and to guarantee continuous operation, Crown Zellerbach seeks to contract for the purchase of 6,200 kw. of prime power and up to 20,000 kw. of secondary power when it becomes available from Bonneville Dam by way of the Olympia-Port Angeles transmission line. Plans for increased production were based on completion of the line by next summer, Mr. Welsh said, unless the Senate Committee allocates the entire amount needed now, the program will be "knocked into a cocked hat."

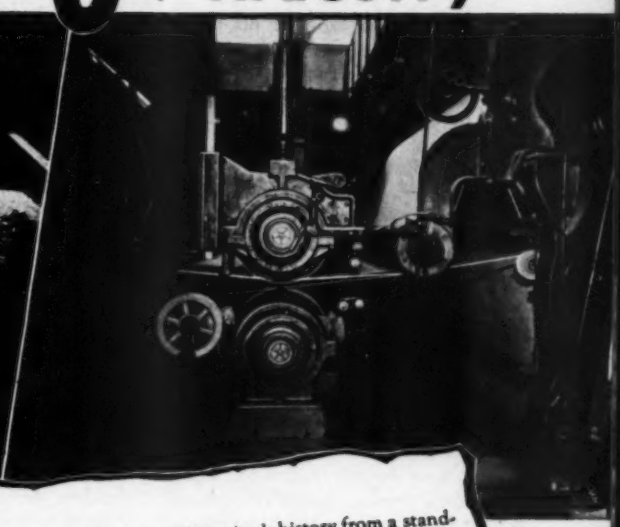
William Welsh, in charge of public relations for Crown Zellerbach, told Rep. Henry M. Jackson and Senator Styles Bridges, chairman of the Senate Appropriations Committee that his company's two hydroelectric dams on the Elwha River near Port Angeles are not capable of further development. They have been inadequate to insure continuous operation for some years, he said.

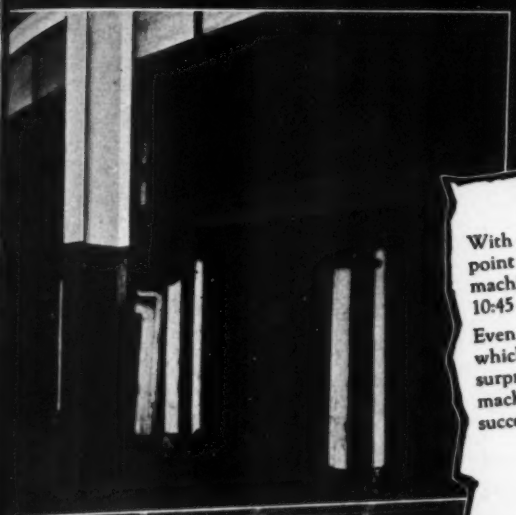
SOUTHERN REPRESENTATIVES APPEAR BEFORE COMMITTEES ON PAPER PROBLEM HEARINGS

A proposal by the Southland Paper Mills, Inc., to buy a Texas national forest was the high spot in the continuing hearings on paper problems by congressional committees. Richard Wortham, Jr., executive vice president of the company, made the formal offer before the House of Representatives newsprint committee, asking that legislation be considered to allow his company to buy the Davy Crockett National Forest and enable his company to produce an additional 60,000 tons of newsprint a year. As an al-

PAPER · · · America's 6th Industry



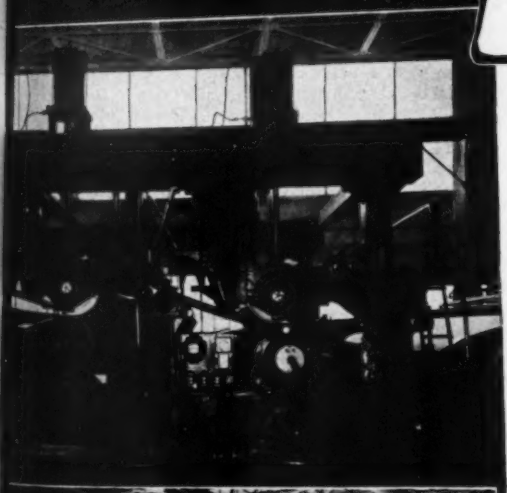


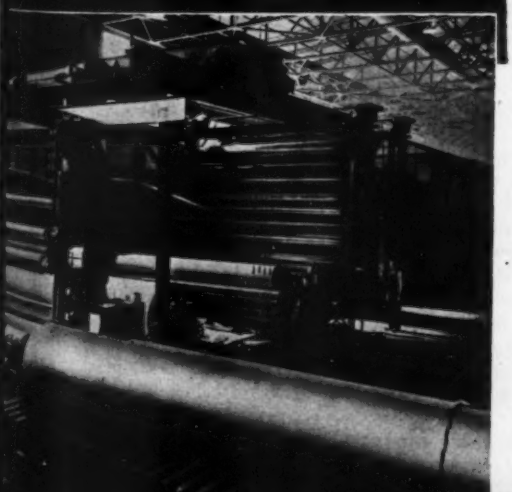


With a start-up which excelled anything in Champion's history from a standpoint of smoothness and efficiency, the world's largest white papermaking machine rolled into solid production in the Canton plant January 31, at 10:45 P. M.

Even Division Manager H. A. Helder was startled by the smoothness with which the new No. 11 machine swung into action. Not only was Mr. Helder surprised with the original operations, but plant superintendents, foremen, machine men and contractors, alike, were virtually overwhelmed with the success of the "first start-up".

Excerpt from "The Log", published by Champion Paper & Fibre Company, March 1947.





FIRST POST-WAR MACHINE

The Pusey and Jones Corporation is proud of the performance of their "world's largest white papermaking machine" designed and built for the Champion Paper & Fibre Company. It is the first Puseyjones machine constructed and installed since V-J Day.

Due to its size many problems were encountered in obtaining material and component parts. Other machines are following in rapid order that will help relieve the tremendous demand for all kinds of paper and board products.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

ternative, he proposed that his company be allowed cutting rights under Forest Service supervision on both the Davy Crockett and the Angelina National Forests. The offer of $10 per thousand for saw timber and $1 a cord for pulpwood, plus the price of the land at which the Crockett forest was originally bought by the Government was opposed by Government representatives who said that the 150 per cent profit to the Government by sale was less than the recreational, watershed and scientific value of the area.

Another southern representative who discussed newsprint was E. A. Charlton, representing a Louisiana Chamber of Commerce. He said that if the planting practices of the Forest Service were strictly followed, Texas alone could produce enough pulpwood to service the entire needs of the South, as of 1947 production. He said that the cost element would be conservatively $10 per ton of paper in favor of the South as against the proposed installations in Alaska.

Defense of the newspapers against charges of excessive use and mal-distribution of newsprint was presented by W. G. Chandler as chairman of the Special Newsprint Committee of the American Newspaper Publishers Association. He opposed federal regulation of newsprint, saying that such control would divert to foreign markets paper now being received from Canada. He said that the current shortage was principally due to increased use of newsprint by periodicals and commercial printers rather than by increased use in newspapers.

◆

COLLEGE OF FORESTRY ANNOUNCES TWENTY-FOUR GRADUATE FELLOWSHIPS

The New York State College of Forestry announces twenty-four graduate fellowships carrying stipends from $455 to $1300 for the college year 1947-48. These fellowships are available to students pursuing study leading to the Master of Forestry, Master of Science, and Doctor of Philosophy degrees.

Recipients may specialize in the following fields of forestry and forest products: Forest botany, forest entomology, forest zoology, wildlife management, silverculture, forest management, forest administration, photogammetry applied to forestry, landscape and recreational management, wood technology, forest products' manufacture and utilization, pulp and paper manufacture, and wood chemistry and plastics.

The number of fellowships and stipends carried are:

1 Teaching and Research Assistant at $1300.
2 Teaching Assistants at $1040.
3 Assistants in Research at $975.
1 Graduate Assistant at $780.
4 Assistants in Research at $682.50.
4 Graduate Assistants at $624.
9 Assistants in Research at $455.

Holders of these fellowships are excused from paying College tuition and regular College fees normally amounting to approximately $400 per year.

Recipients are to assist in teaching and research work for not to exceed 15 hours per week.

Veterans and nonveterans are eligible for these fellowships.

The College has in addition a few industrial fellowships and other special research assistantships which permit holders to carry part- or full-time graduate work.

To be considered for a fellowship an applicant must meet College standards for admission to graduate study.

Applications should be made by June 25 to the assistant dean, The New York State College of Forestry, Syracuse 10, New York.

◆

ANOTHER INCREASE IN PAPER PRICES BY THE CAN. PAPER INDUSTRY

Canada's paper industry announced further price increases—the fourth since controls were instituted in 1941. Increases will run around 5 per cent to 8 per cent.

Domestic prices for book papers were increased $10 a ton at the carload level. Litho papers and offset were increased $15 a ton because of special cost factors pertaining to those grades. There will be varying increases applicable to coated papers, depending on kind and quality.

Other price increases were in April 1946, June 1946, and in January 1947.

◆

FT. WAYNE CORRUGATED PAPER CO. WILL HAVE NEW MODERN OFFICES

The Fort Wayne Corrugated Paper Company, Fort Wayne, Indiana, will occupy the first section of a new $175,000 double "L" twin building to be constructed by John E. O'Connor immediately for use of the paper company and other industrial tenants. The paper company will use the building for its administrative and office operations. Occupancy is expected by late this year, according to President H. M. Treen.

The exterior of the new building will be expressed in the latest development of exterior materials, with most of the exterior in stainless steel. The entrance portion will be used exclusively by the paper company. The first floor is designed for show rooms and the second and third floors will be occupied by the administrative offices of the paper company.

The entire building will be air-conditioned and will be heated with the new radiant floor heating system. Parking facilities will be provided in the rear of the building.

◆

C-Z CONSIDERS PAPER BAG FACTORY PROJECT FOR PORT TOWNSEND

The two-million-dollar improvement program which has been in progress at the Port Townsend (Wash.) plant of Crown Zellerbach Corporation is progressing satisfactorily.

This work, which was first announced in 1945 (Cf. P. I. and P.W., Aug., 1945), includes a $900,000 wood reduction mill, and the installation of evaporators, caustic clarifiers, a Swenson washer and a digester.

In addition, a paper bag factory project is being considered by the company, according to late reports.

The wood reduction mill addition will include two buildings, one to house a chip screen and the other a 175-inch chipper, a drum barker and conveyors to and from the present chipping plant which will remain in use after the new unit is completed.

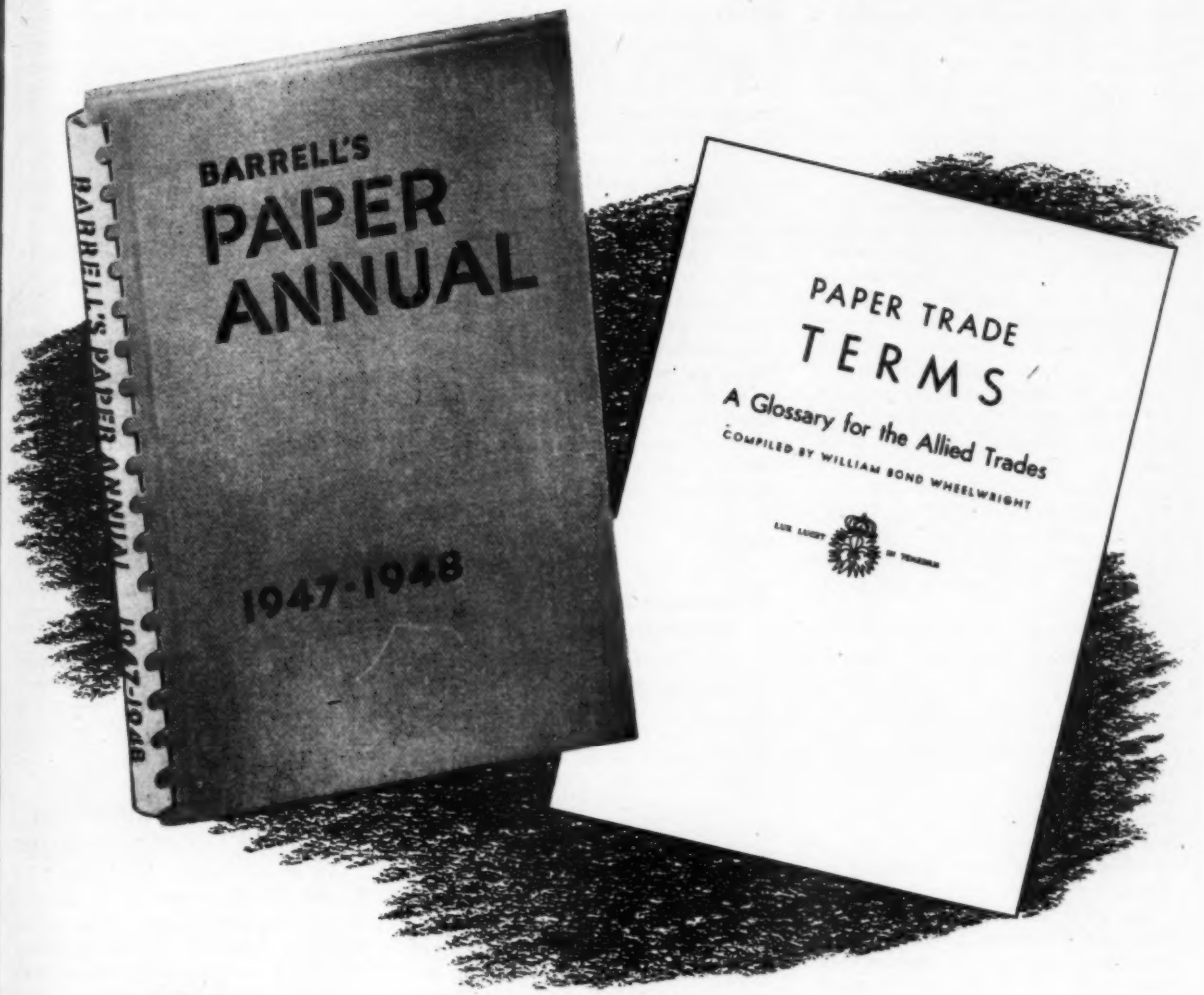
◆

REORGANIZATION CHANGES IN KVP EXECUTIVE CONTROL

Creation of a central staff to take into account the expansion of the company was announced following a meeting of the board of directors of the Kalamazoo Vegetable Parchment Company, Parchment, Michigan, on May 2. The changes amount to a reorganization and consolidation of the executive control of the company, with some of the shifts involving new duties and others constituting a realignment of authority and responsibility.

C. F. Christy, assistant sales manager, has been elevated to the position of vice president and sales manager in the new division of manufacturing and sales. John Woods, who has been vice president and general manager, has been given the designation of manager of manufacturing and is also in charge of all consolidated paper converting operations.

Joseph B. Kindleberger, a vice president, is now in charge of consumer research. Ralph A. Hayward, president, who announced the changes, stated that the department will be devoted to consumer and market research along rather new lines. What



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those lines are was not indicated, but a hint is given in the president's statement to the board that "possibilities for expanding in the converting field are unlimited," made in connection with the company's purchase of the Harvey Company at Sturgis several years ago.

Although KVP's subsidiaries will continue to be operated under existing managements, the organization to administer the enlarged program will be centered in the home offices. Alfred Southon, executive vice president, will direct consolidated sales for all KVP units at the home plant and elsewhere. Thomas W. Peck, secretary and assistant treasurer, will remain in charge of all accounting and finance. L. S. Foster and Harley McDaniel will be in charge of all mechanical and electrical engineering and Frank Libby will supervise consolidated pulp and paper manufacturing. Glenn Stewart continues in charge of company advertising.

Outside the home office, B. F. Avery is vice president and general manager of KVP Company, Ltd., at Espanola, Ontario; George Clark is president and general manager of Appleford Paper Products, Ltd., Hamilton, Ontario; Harold Harvey is president and general manager of the Harvey Paper Products Company, Sturgis, and W. A. Schneider is vice president and general manager of the KVP Company of Texas.

Mr. Hayward pointed out that operations at Hamilton, Ontario, will be enlarged substantially in the next few years with the Appleford Company acting as converter and sales agent for the paper manufactured at Espanola.

◆

PACIFIC PAPERBOARD CO. WILL ADD TWO MACHINES

An expansion program which calls for an expenditure in excess of two million dollars has been announced by the Pacific Paperboard Company, Longview, Washington.

It is understood, from announcement made by E. E. Flood, company president, that the expansion involves the installation of two new machines —one the company's fourth paperboard machine; the other will take the company into the field of newsprint production.

The paperboard machine, an 81-inch used fourdrinier, was purchased by the Owens-Illinois Glass Company. The Pacific Paperboard Company furnishes material used for containers manufactured by the Owens-Illinois Company in its Oakland (Calif.) plant.

The new newsprint machine, which will have a capacity of 100 tons daily, is scheduled to be in operation by October, 1948. This machine, to cost $950,000, will be purchased by a group of western newspapers, including the Copley chain of Southern California. These papers will take the output of the machine. The machine, a 160-inch fourdrinier, with a speed of 1,200 fpm, is to be built by the Moore and White Company, Philadelphia.

The Paperboard company's groundwood plant recently was increased to five grinders, and another 75-ton capacity modern grinder will be installed to supply groundwood needed for the newsprint machine. Recent installations include a new system for conveying logs and a barking and grinding department. A mechanical barker of the drum cylinder type also has been purchased.

◆

ONTARIO-MINN. VOTES TO SPEND MORE MONEY ON IMPROVEMENT PLAN

Modernization and improvement program for the Toronto (Canada) mill of Ontario-Minnesota Pulp and Paper Company Ltd., has received new impetus in an authorization to spend an additional $750,000, bringing to more than $1,500,000 the total cost of the program.

The most important item is the modernization of No. 6 paper machine, rehabilitating it from newsprint production to the manufacture of high-grade groundwood printing papers. Other projects soon to be started or under way include replacing the two boilers in the Fort Frances steam plant with a single unit producing 85,000 pounds of steam per hour, building of mill and logging stores, additional barking drum facilities, extension of finishing and shipping rooms, and extension to No. 3 groundwood mill. For some time the company will continue to be faced with the problem of shortages of equipment and material.

◆

COAL SHORTAGE CUTS DOWN JAPAN NEWSPRINT SUPPLY

A recent press report from Tomakomai, Hokkaido, Japan, points to the coal shortage is primarily responsible for newsprint shortage in Japan. It is stated that the Tomakomai plant of the Oji Paper Company could add 50,000 tons per year to the world supply of newsprint if sufficient coal could be obtained.

This plant now makes about 80 per cent of the Japanese supply of newsprint—325 tons per day. The officials state that about 65,000 additional tons of coal annually would be needed to operate this plant to stated capacity.

Only two other Japanese plants produce substantial amounts of newsprint. A mill at Kushiro, Hokkaido, produces 50 tons daily, and another on Kyushu, a smaller amount.

◆

SOME CANADIAN BOARD IS CLASSIFIED AS DUTIABLE

Based on the opinion of domestic manufacturers, secured through the Import Committee of the American Paper Industry, Canadian board, valued at over 15 cents per pound, has been classified for duty at 3 cents per pound and 15 per cent as pasted bristol. The importer had claimed the material was dutiable at 3 per cent as laminated paperboard.

Imprinted beer mats advertising a Dutch beer, believed to be dutiable as paperboard cut into shapes and decorated, have been claimed by the importer to be dutiable as manufactures of pulp.

English machine glazed envelopes have been held to be dutiable as sulphite stock, not at the lower rate claimed by the imported as semi-bleached kraft.

◆

BOX-MAKING MACHINERY TO BE INSTALLED AT TOMAHAWK

An announcement dated May 5 by Samuel Kipnis, president of the National Container Corporation, states that the company is now installing machinery for the manufacture of corrugated paper boxes in existing space of the Tomahawk Kraft Paper Company, Tomahawk, Wisconsin, one of National Container's wholly-owned subsidiaries. Previously, this plant has manufactured only kraft pulp and kraft board.

When this installation of box making machinery is completed, which it is expected will be within a few weeks, the Tomahawk subsidiary will become a completely integrated kraft pulp, kraft board mill and box plant, serving the company's customers in the middle west. Also this plant will be the first completely integrated kraft pulp and board and box plant operating in the northern part of the United States.

A large addition has been authorized for the Tomahawk plant which will provide additional space for manufacturing corrugated boxes. Box-making machinery will be installed in this new addition as soon as it is completed, which it is expected will be within five months. With this addition, the box division at Tomahawk will be one of the company's major operations. The Tomahawk box plant

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will be supplied with board from the Tomahawk kraft board plant and also will use the output of the Ontonagon Fibre Corporation (Ontonagon, Mich.), a wholly-owned subsidiary of National Container.

◆

BOWATER GROUP REORGANIZED

A reorganization of the Bowater group, has been approved. Under the scheme, Bowater's Paper Mills will become entirely a holding company—at present it combines the functions of holding and manufacturing company—and will transfer its manufacturing assets to a new subsidiary, Bowater's Thames Paper Mills. The two intermediate holding companies, Edward Lloyd Investment and Bowater-Lloyd Newfoundland will be liquidated.

The two operating concerns, the new Thames Company, together with Bowaters & Lloyds Sales and Bowater's Mersey Paper Mills, will be directly controlled subsidiaries of the new holding company.

◆

FINANCIAL

▶▶▶ ALTHOUGH SECURITIES markets gave indications of being in the ebb tide stage, with some severe losses during the month indicating a stabilization at prices much below those of a year ago, paper mill issues, not so sensitive as market leaders felt the effects, to a limited extent, with several recessions in values. None of the losses, however, were severe.

American Writing Paper Corporation—Net profit for the first quarter was $179,926 as compared with $24,474 a year ago.

Eastern Corporation—Net profit for the March quarter was $326,388, as against $111,862 a year ago.

Fort Wayne Corrugated Box Company—Net earnings for the first quarter were $720,534, as against $290,493 a year ago.

Great Northern Paper Company—Net profit for the first quarter was $1,089,278, as against $471,257 a year ago.

Hinde & Dauch Paper Company—Net profit for the first quarter was $906,645, as against $426,100 a year ago.

Kimberly-Clark Corporation — Net profit for the first quarter was $1,957,827, equal to $1.48 per share of common, compared with earnings of 54 cents a year ago.

National Container Corporation—Net profit for the first quarter was $3,109,024, as compared with $707,547 for the similar period a year ago.

Puget Sound Pulp & Timber Company—Net profit in the first quarter was $947,393 in addition to $131,218 received from an installment payment on the sale of Canadian timber in 1944. Net for the first quarter in 1946 was $94,308.

San-Nap-Pak Manufacturing Company—Net profit for the March quarter was $428,081, as compared with $129,077 a year ago.

United Wall Paper Inc.—Net profit for nine months ended March 31 was $1,499,047.

Paper Mill Corporate Changes

P. H. Glatfelter Company has authorized an issue of 6243 shares of 5 per cent cumulative first preferred stock. Plans also are under way for the increase of the common from 11,000 no par value shares to 300,000 shares with a par of $10. When issued, the new common will be offered at $12.50, and a new first mortgage bond issue of $3,000,000 in sinking fund bonds will be used (with the proceeds of the stock sales) to redeem outstanding first mortgage bonds.

Tileston & Hollingsworth Company has sold a $300,000 note to a New England Insurance Company to finance the carrying out of postwar modernization plans.

New York Stock Exchange—Stocks

	Closing Prices May 26	April 25
A.P.W. Products	*4⅛-4⅜	*4⅛-5
Celotex	21⅝	24
Same Preferred	*20¼-20½	21
Certain-teed Products	13⅜	14⅝
Champion P & F Co.	*19¼-19¾	21
Same Preferred	107	*110-111
Container Corp.	34½	37½
Contin. Diamond	9⅛	10⅜
Crown Zellerbach	25⅞	26
Same Preferred	*102½-103¾	104½
Same $4 Preferred	*106-108	110½
Dixie Vortex	*26-26½	...
Same "A"	*50-50½	...
Robert Gair Co.	6½	6¾
Same Preferred	*19¼-20⅛	20
Gaylord Container	*15-15½	15⅜
Same Preferred	*86-100	*90-100
International Paper	40⅞	40¼
Same Preferred	*100½-102	102¼
Kimberly-Clark	*23-23⅞	24⅛
Same Preferred	107⅛ *106¼-106¾	
McAndrews & Forbes	*34⅞-36	34
Marathon	20½	22
Masonite	42⅞	45¾
Mead Corp.	17	19⅛
Same Preferred	*90-94	100
Same 2nd Preferred	*43½-46	49
National Container	35¼	35⅝
Paraffine Cos.	*58-62	68
Same Preferred	*108-109½	*107-110
Rayonier, Inc.	19⅛	20
Same Preferred	*36¼-37⅜	36½
Scott Paper	*43¼-44¾	*43-44⅝
Same Preferred	98½	*97½-99
Sutherland Paper	*36½-38	*39¼-40
Union Bag & Paper	27½	29
United Paperboard	*4-4½	15
U. S. Gypsum	91½	86⅞
Same Preferred	*193-196	*194-196
United Wall Paper	7¼	8½
Same Preferred	*42-46	*45-46
West Va. P & P Co.	35¼	37½
Same Preferred	110¾	*112-115

New York Stock Exchange—Bonds

Celotex 3½%	...	...
Champion P & F Co. 3%	...	103

New York Curb Exchange—Stocks

Am. Writing	8½	8¼
Great Northern	...	40¼
St. Regis	8⅛	9
Taggart	...	9

*Closing Bid and Asked Prices.

OPTION TO PURCHASE HAWLEY CO. HAS BEEN FORFEITED

Announcement was made on May 31 by John H. Smith, president of the Hawley Pulp and Paper Company, Oregon City, Oregon, that the projected sale of the company to three eastern buyers for $7,900,000 has been canceled, and that a $300,000 initial payment has been forfeited. Mr. Smith stated no further payments had been made up to the May 31 noon option deadline.

The option was given February 14 to John D. Wilson, Scarsdale, New York; R. B. Gerard, Kent, Connecticut; and James H. Molloy, Philadelphia. These gentlemen are owners of the Claremont (N. H.) Paper Corporation. (Cf. P.I. and P.W., April, 1947, and May, 1947.)

◆

BRITISH PAPER NOTES (April, 1947)

Slightly better news is being received from the British Paper Mills since with small supplies of coal coming forward many have started up again, but the possibility of a general resumption on full time is not yet apparent. But as the Minister of Fuel has announced larger allocations of coal in the near future, it is hoped that the paper trade will receive more than the initial 33⅓ per cent promised at the end of the coal crisis. This promise recently has been increased to 50 per cent up to the end of May, and it is sincerely hoped that this revised promise will be redeemed.

There is little doubt that wherever possible the trade will do its utmost to avoid a repetition of the experience of the past winter and any avenue which offers the remotest promise of aid in the future is being studied.

Happily, the returns of coal production show a steady increase in tonnage. Whether the aggregate will eventually be reached providing the target set for the year by the government is problematical and opinions are severely divided.

Meanwhile, the continual shortage of raw materials and the probability that this will remain for many years is reviving the wartime idea of straw pulp producing plants. There is an abundance of straw in the country and the erection of a few of these plants would go a certain way toward making the paper trade of this country independent of imported raw materials. But, unfortunately, the shortage of steel and labor prevents any real move in this direction.

Although there are constant reports of negotiations for future supplies of wood pulp from Scandinavia, nothing

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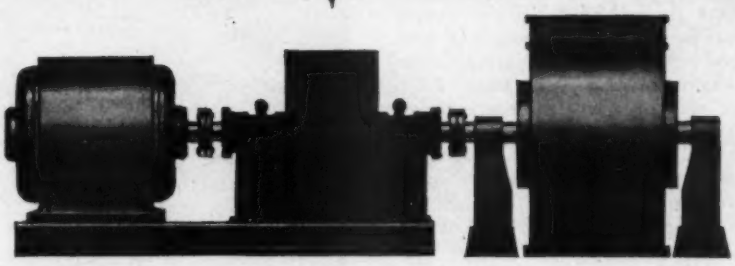

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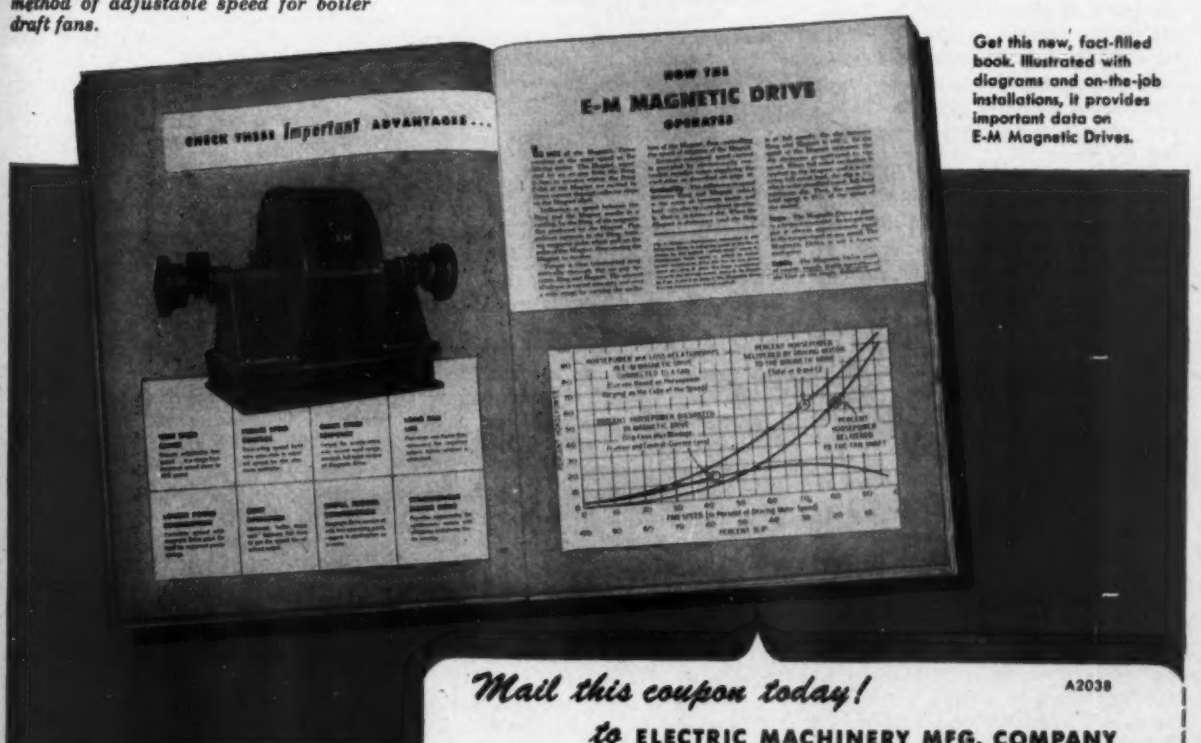

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definite has been recorded. Against this the shipments of esparto grass from Africa are steadily on the upgrade; these are already over 80 per cent of prewar. Thus, the esparto mills which are mainly situated in Scotland are in a doubly envious position for they are not only receiving good supplies of their principal raw materials, but they are better situated than the English mills for coal deliveries.

As the annual general meetings of the mill companies are reported so the full effects of the coal crisis are becoming apparent. As an example, the Olives Paper Mill which in normal times has a fairly large output of pure wood papers report that during the ten weeks of coal cuts, up to March 22, it was able to operate during part of four weeks only. Added to this the recent instruction by the Paper Control that wood free papers were not to be exported also has hit this mill and its fine export trade with the Colonies.

Confirmation of the serious view of the present coal position was received at the annual general meeting of the Paper Makers' Association when it was announced that a special committee had been appointed to examine the question of an adequate coal supply to the paper and board industry. Grenville Beckett was re-elected president and among the more interesting statistics of the trade given in the report were those for production covering the years 1938, 1945 and 1946. In 1938 just over 2,500,000 tons were produced but in 1945 this dropped to a little more than 1,300,000 tons, rising in 1946 to 1,735,190 tons or approximately 69 per cent of prewar. Material imports for the three years were 1,963,836, 709,519, and 953,689 tons respectively; the latter two returns representing 36 per cent and 48 per cent of 1938. Imports of paper in 1946 (30 per cent of 1938) were actually lower than in 1945 (31 per cent of 1938) but on the export side, while the rate for 1945 represented only 20 per cent of 1938 in the following year, this was raised to 64 per cent of 1938. This considerable rise in exports despite all the difficulties encountered was very encouraging but, of course, far below the ultimate aim.

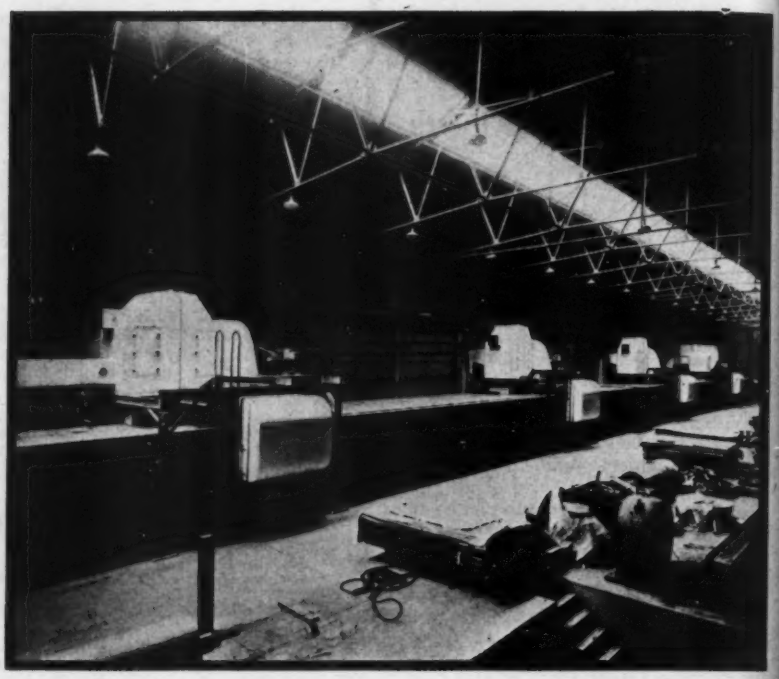
Among other incidental items mentioned in the report was the then forthcoming International Trade Conference in connection with which the P.M.A. submitted to the board of trade a statement expressing the view of the industry on the main features of the proposals put forward by the U. S. Government.

Included among the guests at this meeting were Elliott Little, president of Anglo-Canadian Pulp and Paper Mills Ltd., and of the Anglo-Newfoundland Development Company Ltd., and Norman Robertson, the Canadian High Commissioner in London. In welcoming these guests, Kenneth Linforth referred to the valuable aid Great Britain had received during the war years from Canada. Looking to the future he expressed the opinion that it was necessary to convince the Canadian producers that the British mills were seeking a permanent source of supply for increased quantities of Canadian wood products and not short-term supplies to get them through the present period of shortage of European supplies. That being the case, it was necessary for the British papermakers to find a method whereby the Raw Materials Division of the Board of Trade "would be prepared to enter into long term contracts with Canadian producers; the responsibility for which would be taken over by private producers as soon as control is lifted".

While this suggestion may meet the future, the immediate situation is at last creating alarm outside the paper trade. Headed by a leading journal of the printing industry wherein a writer predicted that if coal supplies to the paper trade prove to be totally inadequate then the country would head straight for a paper crisis, this fear was taken up by one of the most conservative of the Sunday newspapers in an editorial and contributed articles explaining to the nation the precarious situation and was followed by a similar exposition by one of the strongest antigovernment weekly newspapers. The latter touched upon two sore points among paper users. The favored position of the book publishers, who, during the past three years, have been receiving a higher paper quota than any other section of the trade and who are now accused of holding large accumulation of paper (mainly due to arrears in printing and binding), and His Majesty's Stationery Office, who, it is stated, have sufficient stocks of paper which if released would greatly relieve the immediate paper shortage.

The Sunday paper was supported by the president of the Paper Makers' Association who stated that unless the public became alive to the position and demanded action by the government, users in Great Britain will have to face a worse position than any experienced during the most difficult years of the war. He further suggested that production this year might reach 1,000,000 tons. Even if this figure is reached, it would be only 39 per cent of prewar production and little more than half of 1946 output.

Additional moves in an effort to improve matters were made by the Envelope Manufacturers and Manufacturing Association in a letter to the



A straight path dryer in a new plastic treating system installed in England for impregnating kraft paper with plastics in solution. This system is capable of handling impregnated kraft paper 110 in. wide at a maximum speed of 200 fpm. The control panel can be seen mounted centrally between the four plants. This modern installation was made by Carrier-Ross Engineering Co., Ltd., of London, an affiliate of J. O. Ross Engineering Corp. of New York

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board of trade. Anticipating only 30/33⅓ per cent of prewar supplies this license period, they considered a shortage of time cards, wage envelopes, school exercise books and registers, etc., as probable.

Meanwhile Sir Stafford Cripps (president of the board of trade) is being questioned in the House on the same subject. In his reply he referred to the raising of the coal allocation to 50 per cent of 1946 for the paper mills (when incidentally practically every mill was living from hand to mouth) and mentioned that paper producers had been advised of certain purposes for which priority, if possible, should be given and "we are considering the possibility of taking special action to maintain the production of educational textbooks." He further stated that the estimated consumption of coal by the paper mills was 67,000 tons per week.

The board of trade returns for the first quarter of the present year discloses a further difficulty for the British papermaker. Although the imports of materials in total represent an improvement on the same period of last year, the respective totals being 204,281 and 174,130 tons, it is seen that this advance is entirely due to additional arrivals of esparto grass, wood pulp imports have declined appreciably. The chemical, dry, bleached has been lowered from 31,011 to 20,452 tons, the dry, unbleached from 83,036 to 72,877 tons and the wet chemical pulp from 14,393 to 2,866 tons while the mechanical pulp has declined from 35,276 to 29,406 tons. This represents a total loss of 38,115 tons. In 1938 Great Britain imported 404,493 tons of wood pulp during the same period consequently these imports have fallen back to 31 per cent of prewar. The imports of esparto grass have risen from 5,392 to 74,024 tons comparing January-March 1946 with 1947 and at the moment they are 96 per cent of the prewar rate of importation, from Tunis they are actually 122 per cent. Incidentally, it is noticed that during these periods imports of materials from the U.S.A. have risen from 459 to 2,265 tons. Canadian returns have dropped by approximately 14,000 tons and those from Newfoundland by 1,400 tons.

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IMPORT NOTES

The United States Court of Customs and Patent Appeals has rendered an important decision on the dutiability of English goods purchased by use of the so-called "free" exchange, holding that such merchandise is dutiable at the exchange value of the official pound sterling and not at the more favorable free exchange rate as claimed by the importers. According to Warren B. Bullock, manager of the Import Committee of the American Paper Industry, this decision was rendered on merchandise other than paper, but the principle will apply to shipments of various British papers imported in the same manner. The cases involving British paper will eventually be decided on the basis of the decision in the test case. The same principle is expected to apply to several shipments of Canadian paper which were carried to the courts in similar pleas by the importers.

Customs officials have decided that a shipment of British envelopes is dutiable at the rate for envelopes of M. G. Sulphite paper, and not, as claimed by the importer, at the lower rate for M. G. Kraft.

Customs officials are investigating a question involving the dutiability of paper for stenographers note books, believed by the importer to be dutiable at the rate for printing paper, and not at the higher rate for writing paper.

According to Mr. Bullock, paper imports in March showed a material increase over those in February. One shipment of English carbonizing tissue totaled 150 tons.

◆

ADDED EXPENDITURES FOR PROVINCIAL PAPER EXPANSION PROGRAM

Extensions to the plant of Provincial Paper, Ltd. (Port Arthur, Ontario) involving an expenditure of $425,000 apart from a $400,000 program authorized a year ago, were outlined recently by E. Lorne Goodall, general manager of the plant.

The $825,000 program, which started last year, will be completed in June, 1948. The first half covering equipment and additions to produce a new type of paper, is scheduled for completion this summer.

◆

WESTMINSTER PAPER CO. PLANS TO BUILD GROUNDWOOD MILL

The expansion program started in 1945 at the plant of Westminster Paper Company, Ltd., New Westminster, British Columbia, is already stepping up that company's production. The new No. 2 paper machine started production in March. When additional converting equipment is combined with the new machine, production will be doubled.

The company increased its land holdings during the past year through acquisition of property immediately west of the plant site and additional property from the city of New Westminster, on which a new office building will be erected in the near future. New filter equipment will mean better water supply.

A groundwood mill will be built on the recently acquired property and should go into production by late summer. This is covered by new financing amounting to $960,000, and will supply pulp for both the Westminster plant and the company's affiliate, the Pacific Coast Paper Mills, Bellingham, Washington.

Work on the new boiler house and high pressure water-tube boiler and steam turbine, now in progress, will be finished by midsummer.

◆

TIMBER INTERESTS BOUGHT BY COLUMBIA RIVER MILLS

Negotiations have been completed, according to announcement made May 15, by which the Columbia River Paper Mills, Vancouver, Washington, acquired stock and timber of the Werner Timber Company in Lincoln County and the personal timber interests of Joseph L. Werner, financier of St. Louis and owner of the Werner company.

The consideration of the transaction was not revealed, but it was stated that the purchase would make no change in policies followed by the Werner interests which has supplied hemlock to the Columbia River company and the Oregon Pulp and Paper Company, Salem, Oregon.

◆

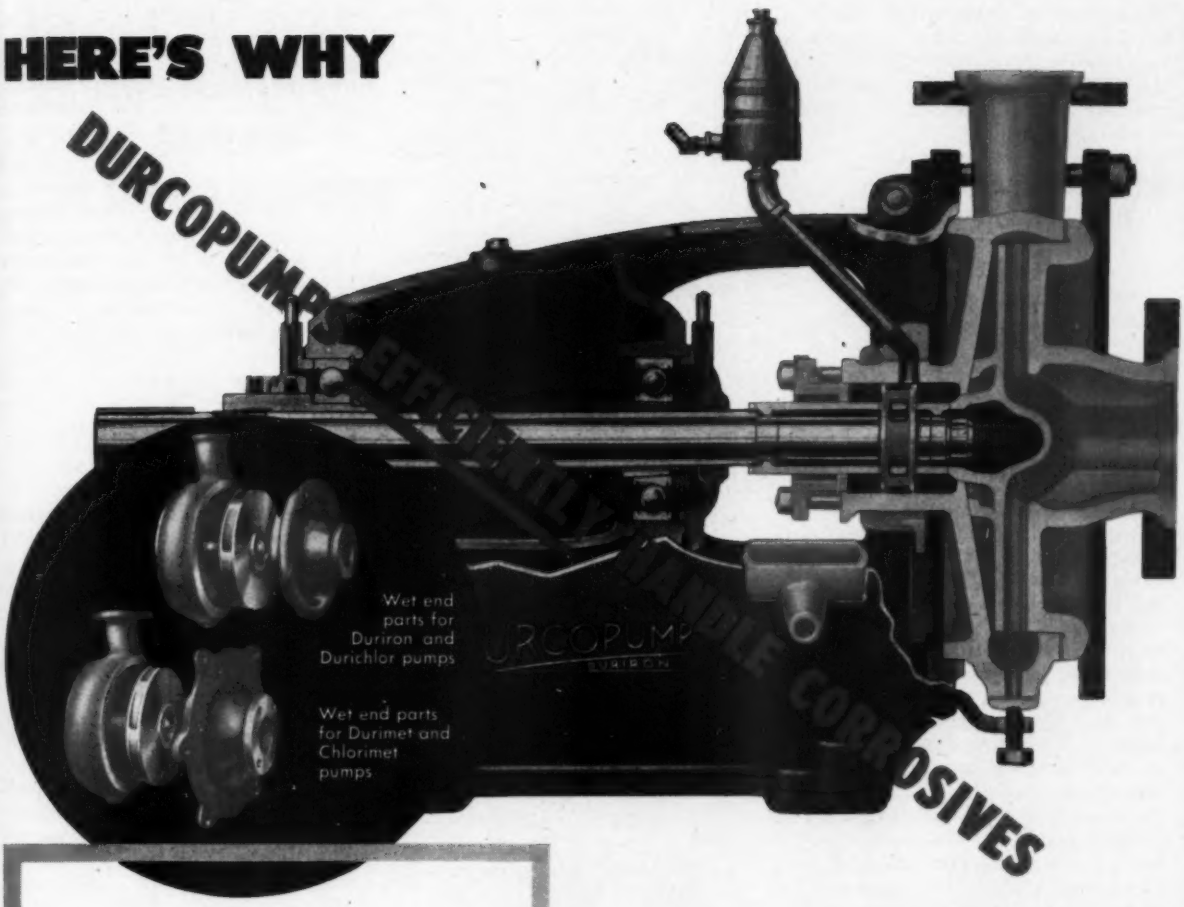
GOVERNMENT STUDIES PLAN TO KILL BUDWORM WITH DDT

Destruction of valuable forests by the spruce budworm has been increasing in New York state and Maine for the past few years. It is stated by the U. S. Department of Agriculture that the present shortage of newsprint in North America is partly due to the current budworm outbreak in Canada.

To date no practical means of destroying this pest has been found. Most infected areas were inaccessible for spraying, and treating the timberlands from the air with the older insecticides was too expensive. It has now been found, however, that DDT applied from the air will kill budworms and may be developed as a practical means for controlling these epidemics. The perfecting of apparatus and spray mixtures is still in the experimental stage. However, the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture has set up a laboratory at the Agricultural Research Center, Beltsville, Maryland, to study field conditions. Similar work will be conducted

HERE'S WHY

DURCOPUMPS EFFICIENTLY HANDLE CORROSIVES



DURIRON—a high-silicon iron (14.5% Si.) which handles most commercial corrosives—particularly sulfuric, nitric and acetic acids at any strength or temperature. *Ask for Bulletins 11 and 810.*

DURICHLOR—a high-silicon molybdenum iron with much greater resistance to hydrochloric acid and its compounds, especially at higher temperatures and concentrations. *Ask for Bulletins 50 and 810.*

DURIMET—a high Ni-Cr-Mo-Cu low carbon stainless steel. Successfully handles sulfuric and sulfurous acids, oleum, caustic, bleach and other solutions. *Ask for Bulletins 110-2 and 811.*

CHLORIMET NO. 2—nickel-base, high molybdenum alloy; **CHLORIMET NO. 3**—nickel-base, high molybdenum, high chromium alloy. These are high-strength, machinable alloys. Chlorimet No. 2 handles HCl in all concentrations and temperatures. It is excellent for hot H_2SO_4 acid under reducing conditions and wet hydrogen chloride gas. Chlorimet No. 3 handles most acids under oxidizing conditions, various salt solutions, also hot sulfuric in concentrations of less than 35%. *Ask for Bulletins 111 and 811.*

OTHER ALLOYS—Durco D-10, Monel, Inconel, Pure Nickel, Ni-Resist and Nickel Cast-iron.

1. The *best* alloy to withstand the particular corrosive service is selected for the wet end parts.

2. High efficiency is designed into the pump without using extremely close clearance between casing and impeller.

3. No internal bearings.

4. Extra heavy base supports both *top* and bottom of wet end to insure alignment and prevent distortion.

5. Oversize ball bearings for long life and rugged service.

6. Stuffing box of adequate depth for high suction and discharge pressures. The patented Durco double vane impeller relieves the pressure on the stuffing box.

Don't forget—the wet end parts of Durcopumps are interchangeable. You can change from one alloy to another to fit different corrosive services.

Model 40 Durcopumps are available in capacities up to 2,000 G.P.M. and for heads as high as 230 feet.

THE DURIRON COMPANY, Inc.

DAYTON 1, OHIO Branch Offices in Principal Cities

DURCO

DURCO Adv. 33-GM

this summer in laboratories in Northern New York and Ohio, with the hope that tests will point the way to the development of effective and economical control measures for commercial use.

◆

SCHOLARSHIP AWARDS TO FIVE WISCONSIN BOYS BY "TREES FOR TOMORROW"

Five Wisconsin Valley boys have been named winners in the annual $2,500 Trees for Tomorrow Inc. Forestry Scholarship program. The awards of $500 each were made on the basis of interest and aptitude shown by applicants in forestry as a career. They were presented at commencement exercises in five Valley high schools.

The successful candidates are: Gerald Arnold, Wisconsin Rapids; Wayne Jensen, Stevens Point; James Justesen, Mosinee; Donald Preilipp, Wausau; and Richard Guth, Eagle River.

Applicants for the scholarships must fill in entry blanks, which reveal the amount of work done on school forests and in school conservation activities, and write a 300-word essay. A five-man committee in each of the five districts also interviews each of the applicants. Chairmen of the scholarship committees in these districts are C. J. McLaren, Tomahawk Kraft Paper Company; N. S. Stone, Mosinee Paper Mills Company; D. C. Everest, Marathon Corporation; A. J. Schierl, Whiting Plover Paper Company; and E. B. Hurst, Consolidated Water Power and Paper Company.

◆

UNION BAG FORMS 25-YR. CLUB WITH 141 MEMBERS

Starting with a membership of 141 employees with 25 years or more of service, the Quarter Century Club of Union Bag & Paper Corporation was formed recently at banquets held in New York City and Glens Falls (N. Y.), at which each member was presented with an engraved gold watch.

Twenty-three veterans of the New York headquarters, including president Alexander Calder himself, who joined the company as a salesman in 1913, were honored at the Waldorf-Astoria, May 1. Oldest New York employee in point of service is Crawford Palmer, consultant to sales manufacturing control, who joined Union Bag 48 years ago in the Hudson Falls (N. Y.) plant as a clerk.

One hundred and eighteen veterans of the Hudson Falls specialty bag plant were presented with engraved watches at a dinner at the Queensbury Hotel, Glens Falls, May 3. Oldest Hudson Falls employee is Paul Brunette, Sr., with a record of 54 years with the company. Twenty-three Hudson Falls veterans have served 40 or more years with Union Bag, while the 118 with 25 years or more of service represent nearly 10 per cent of the total employment of 1,200.

◆

WEST TACOMA NEWSPRINT PLANT NOW IN PRODUCTION

The modernization of the West Tacoma (Wash.) Newsprint Company plant has been completed and newsprint production was begun early in May.

This plant, which was formerly the Cascade Paper Company and more recently the Everett Pulp and Paper Company, was taken over by the present owner last year (Cf. P.I. and P.W. June, 1946). The West Tacoma Newsprint Company is controlled by a group of fourteen West coast newspapers.

The mill is producing 60 tons of newsprint daily. Wood is obtained from relogged salvage stands of the St. Paul and Tacoma Lumber Company.

BRIEFS

▶▶▶ WORK IS UNDER WAY on the $150,000 transformer station which will bring in power from Campbell River for the new Bloedel, Stewart and Welch Company, Ltd., pulp mill at Port Alberni, British Columbia. Progress already is being made on the steel towers which will carry the transmission from Dunsmuir on the east coast of Vancouver Island across 16 miles of virgin wilderness around Horne Lake.

◆

▶▶▶ A NEW PLANT for the manufacture of all types of paper products will be erected by the Walloomsac Paper Mills, Inc., of New York City on a site just purchased in the town of Half Moon near Mechanicville, New York.

◆

▶▶▶ THE PASSAGE OF a bill to protect domestic wool growers by higher tariffs in the guise of price-maintenance by the Department of Agriculture is viewed in some quarters as endangering the entire trade agreement negotiations now in progress at Geneva. Because of the importance of wool to Australia and other portions of the British Empire, it is said that its chief bargaining advantage has been lost to this country. It is more and more evident that the other participating nations are far less eager to see tariff reductions than this country.

◆

▶▶▶ THE COMPLETION OF a new corrugated box manufacturing plant for the Mengel Company, Fulton, New York, has been announced by the H. K. Ferguson Company. The new plant is constructed of brick, concrete block, and structural steel and contains approximately 70,000 square feet of floor space.

◆

▶▶▶ CONTRACT HAS BEEN given to The Rust Engineering Company by The Flintkote Company for the design and construction of a boiler house extension and the installation of a 150-hp. combustion boiler and accessories at Meridian, Mississippi. The cost is stated to be in excess of $40,000.

◆

▶▶▶ ONE THOUSAND DOLLARS in scholarships will be awarded six seniors of Escambia and Santa Rosa County (Florida) high schools this year by J. H. Allen, president of the Florida Pulp and Paper Company, Pensacola, Florida. From twenty-three entrants now in the contest, three outstanding boys and three outstanding girls will be chosen to receive scholarships. First two awards are $250 each; the second two awards, $150 each. Third place winners will receive $100 scholarship each.

◆

▶▶▶ A SERVICE PLAQUE was unveiled recently by Knowlton Brothers, Watertown, New York, in honor of three former employees who were lost while in service during the war. David C. Knowlton, vice president of Knowlton Brothers, spoke briefly at the unveiling ceremonies which were witnessed by relatives and friends of the men.

◆

▶▶▶ SIX FRENCH PAPER manufacturers, on a tour of American paper mills, were guests of the Strathmore Paper Company, West Springfield (Mass.), and the American Writing Paper Corporation (Holyoke, Mass.), May 1. The visitors were Adolph Halard, Roger DeVouge, Rene Sibille, E. de Guillebon, Pierre Martin and Pierre Motel.

◆

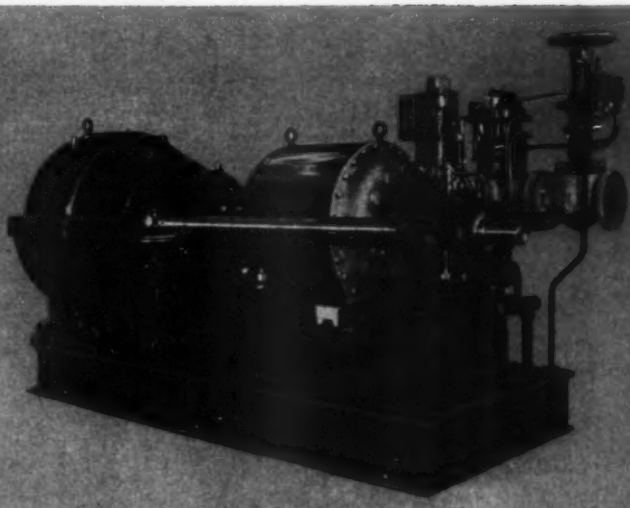
▶▶▶ PREVIOUS ARRANGEMENTS made by the Canadian Wartime Prices and Trade Board concerning shipments of newsprint will conclude on June 30.

ELIMINATE SPEED FLUCTUATIONS

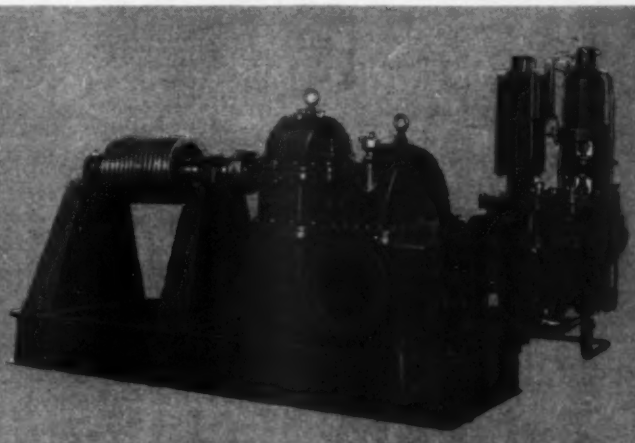
with Worthington Paper Machine Drives

Continuous steady speed operation invariably follows when Worthington Steam Turbines take over the driving job The isochronous governor assures no change in operating speed from minimum to maximum load for any given control setting A special single-seated governor valve or valves give stable operation at low loads. In addition, the governor is adjustable over complete range to accommodate any paper machine requirement — remote speed controls can be provided if desired. Turbine-driven auxiliary oil pump protects against shutdown from power failures.

Whether your conditions call for automatic or hand nozzle control, direct connection or belted to line shaft, you can depend on Worthington to manufacture a smooth-running, economical steam turbine for any size of paper or board machine. Call your nearest Worthington office for more information proving that — in steam turbines as in so much other equipment — *there's more worth in Worthington*. *Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.*



Worthington Steam Turbine with double extended gear shaft for direct connection into the line shaft of a large paper machine

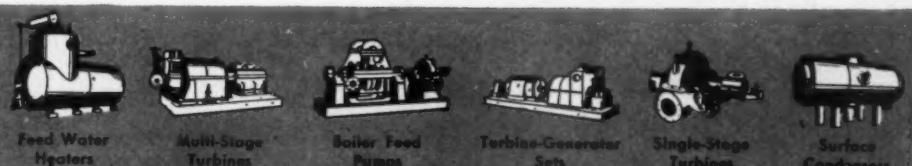


A small Worthington paper machine drive unit for belting to drive shaft

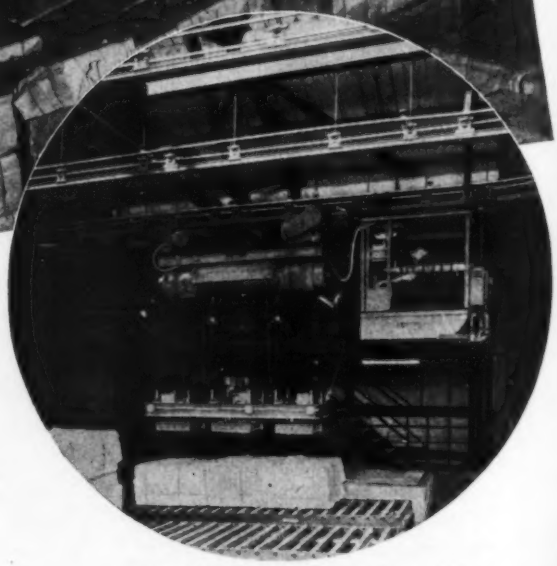
WORTHINGTON

77-4

A GREAT TEAM IN STEAM



One Cleveland Tramrail system with screw-type grab serves this 8000-ton pulp storage room.



Three bales are picked up at a time with this patented Cleveland Tramrail screw grab. Motor-driven screws secure and release bales without operator leaving cab.

CLEVELAND TRAMRAIL SYSTEM with

NEW SCREW GRAB

makes big savings in

Baled Pulp Handling

A Cleveland Tramrail screw-type grab permits one operator in most mills to take care of the complete pulp-handling job, faster and more economical than ever before possible.

The grab has motor-driven auger-shaped screws that worm into bales of pulp, holding them securely for transportation. Bales are released by reversing the screws. All operations are controlled by the cab operator without need of his leaving the cab.

Complete plant coverage may be obtained with a Cleveland Tramrail Pulp-Handling System. Bales may be picked up at unloading platform, placed in storage, reclaimed from storage and delivered to breaker beaters.

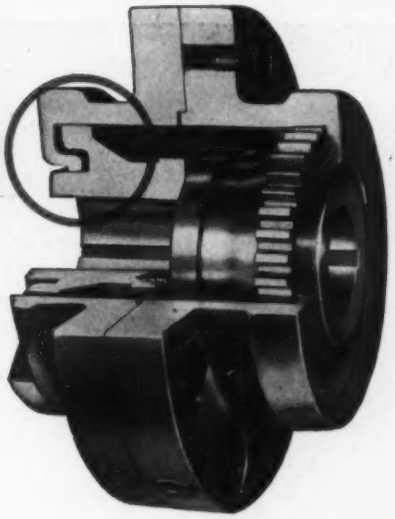
GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

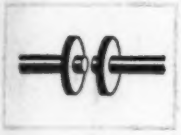
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7005 East 287th Street, WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Specify FAST'S—Get This EXTRA Protection *Against* COUPLING SHUTDOWNS

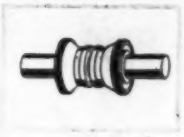


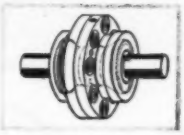
Metal-to-Metal Seal Keeps Oil Clean for Continuous Service!



Fast's Couplings Are Simple as A-B-C

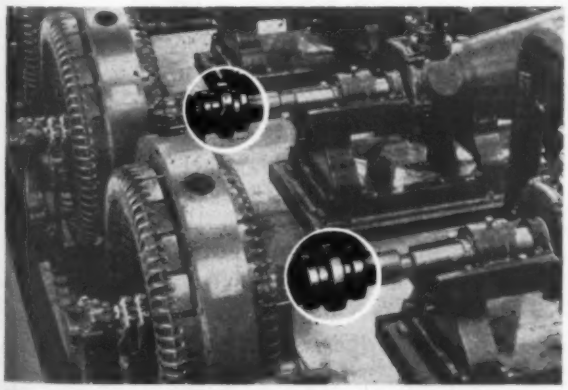
See the simple development of Fast's Couplings. A splined hub on each shaft end, a sleeve with internal splines to mesh. Oil in the sleeve carries the load between the splines.





You can trust Fast's, the *original* gear-type coupling, which eliminated the need for *perishable* parts! The load-carrying oil in a Fast's Coupling is guarded by a positive metal-to-metal seal . . . the *exclusive* "rocking bearing" shown in the circle. The oil is kept free of moisture, dust and grit. No perishable packing rings are used. That's why you get *uninterrupted* power transmission with Fast's.

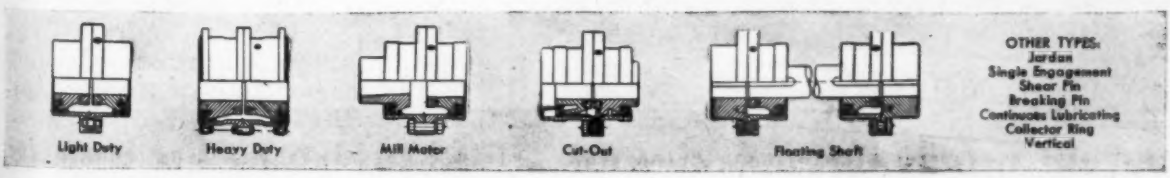
When you buy Fast's Couplings, you buy many years of top engineering experience, Koppers' high standard of workmanship and unexcelled coupling service. It will pay you to install Fast's . . . for longer machine life, lower upkeep costs, minimum shutdown losses. Write today for our complete catalog to: Koppers Company, Inc., Fast's Coupling Dept., 236 Scott St., Baltimore 3, Maryland.

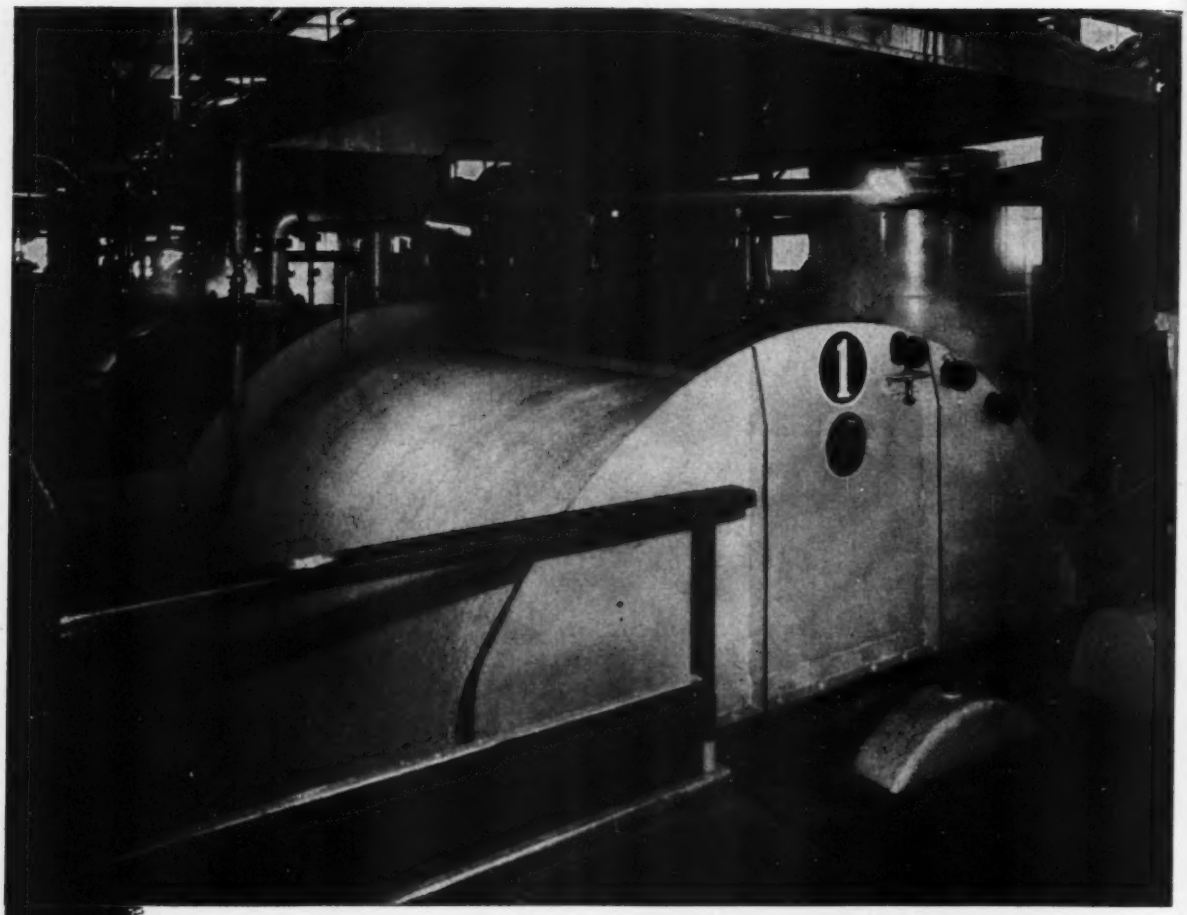


PART OF A BATTERY of ten Jordan Engines equipped with Fast's Jordan Type Couplings at Union Bag & Paper Co., Savannah, Ga.

K KOPPERS

FAST'S *self-aligning* COUPLINGS





Pulp Washing in a Closed System

Are you losing valuable chemicals to the sewer?

Then investigate the Swenson-Nyman Pulp Washer which operates as a completely closed system and permits the escape of only the residual chemicals contained in the washed sheet—as low as 20 to 50 pounds per ton of pulp.

Are your steam costs too high?

Then you will be interested in how much less dilution there is with a Swenson-Nyman System—how it brings important reductions to evaporator loads.

Do you have trouble with foaming, backwashing, channeling?

Let us explain how Swenson-Nyman multi-stage countercurrent washing has been engineered to overcome these difficulties . . . how multiple units provide 3, 4, 5, and 6-stage operation . . . how it has brought increased efficiency in the manufacture of wood pulps. Write for Bulletin F-104.

SWENSON

SWENSON EVAPORATOR COMPANY

Division of Whiting Corporation
15653 Lathrop Avenue, Harvey, Ill.
Export Dept.: 136 Liberty Street
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KRAFT PULP DECKERS • BLACK LIQUOR EVAPORATORS • LIME SLUDGE FILTERS • BLOW CONDENSERS

That all-too-common slow-down of production, with resultant climbing costs and falling profits, often turns out to be related to an outmoded crane. To help correct such a situation, consider a new diesel-powered AMERICAN Locomotive Crane. When American Hoist engineers set out to build this crane, they did not redesign a steam crane but started anew "from scratch". Every part, from rails to boom tip, has been designed specifically to match and balance diesel power. There is nothing finer on the rails.

American Hoist
and DERRICK COMPANY

Saint Paul 1, Minnesota

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DIESEL-ELECTRIC LOCOMOTIVE CRANE, PATENT NO. 2083480
TOUCH CONTROL, PATENT NO. 2370856

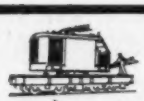
736

America's Number One

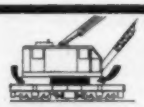
Locomotive Crane

Ask the man in the cab!

NO DANGEROUS SWINGING DOORS



ENCLOSED ROLLER-BEARING TURNTABLE



14-INCH "LIFEGUARD" DECK CLEARANCE

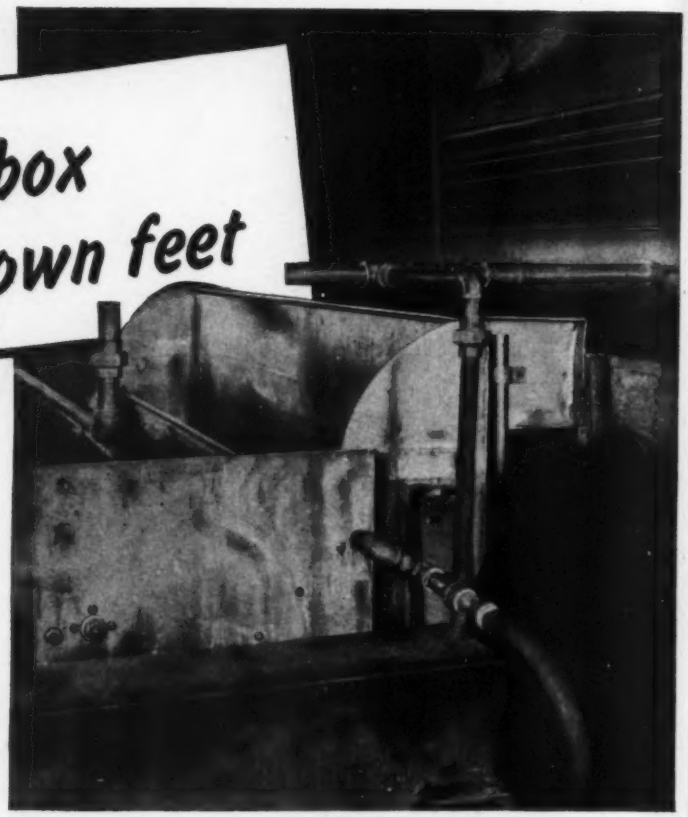
WIDE ANGLE *WORK* VISION

ENCLOSED, OIL-BATHED TRANSMISSION

AIR POWERED ANTI-FATIGUE CONTROLS

This headbox stands on its own feet

Entirely self-supporting, it's another example of Monel's many wet end uses



MONEL HEADBOXES are now standard equipment for Fourdrinier wet ends at plant of The Crane Company, Dalton, Mass. *Fabrication and installation by The Berkshire Sheet Metal Works, Pittsfield, Mass.*

Headbox problems are few in The Crane Company's mill at Dalton, Mass.

For Crane has standardized on Monel.*

And Monel headboxes are installed in one piece. They're *self-supporting.* They stay tight and don't leak.

They have no wood joints to swell and spring out of place. They need no protective paint. No preservative of *any* kind.

Smooth . . . and easily cleaned

Monel is both stronger and tougher than mild steel. It resists corrosion by paper stocks and white waters. Its surfaces stay smooth, and never give slime and fibre accumulations a chance to dig in and hang on. That's why it's so easy to keep Monel headboxes slick and clean merely by rinsing them with a fresh water hose.

Readily fabricated

Monel presents no problems to experienced fabricators. They can do almost anything with it. For example, The Berkshire Sheet Metal Works, Pittsfield, Mass., cut, bent and welded this headbox by commonly used methods.

For other jobs too

Because Monel shows no galvanic reaction with copper or brass parts, it has many uses throughout the wet end. Specify it for save-all pans and trays, suction boxes, rods, rolls, rails, fastenings, doctors and slices, as well as for headboxes. Let Monel help make *all* your equipment long-lasting and trouble-free.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET, NEW YORK 5, N. Y.

MONEL

NICKEL INCO ALLOYS

MONEL* • "K" MONEL* • "R" MONEL* • "KR" MONEL* • "S" MONEL*
INCONEL* • NICKEL • "L" NICKEL* • "Z" NICKEL* *Reg. U. S. Pat. Off.

The Two Best Things You Can Put Between a Diesel Bearing And Shaft Are: Proper Lubrication And

N-B-M DIESEL ENGINE BABBITT

- Bonds easily—resists squeezing out
- Excellent embedability and hardness retention
- Great compressive strength and safety factor are your surest protection against seizure, fatigue and overstress.

N·B·M

Brake Shoe NATIONAL BEARING DIVISION
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PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

The Paper Package that Started a Revolution

Fifty years ago, most of the nation's foods were sold in bulk. Sacks and barrels slumped on the grocers' floors. Customers were served by hand and scoop.

Then in 1898, National Biscuit Company developed a new soda cracker, sealed it in a protective paperboard carton lined with wax paper and covered with a printed paper wrapper. It gave the product a name, "Uneeda Biscuit," and advertised it to the world. A uniformly good product; a sanitary package; a distinctive name; advertising. Together they revolutionized merchandising.

More manufacturers packaged their goods in paper. Advertising increased. Publications prospered. Sales soared. Business boomed. More people had jobs at better wages—to buy more goods! All because of paper. Today, paperboard accounts for more than half the tonnage of all the paper made in America.

The dramatic story of paper is told in the sound-and-color film, "Paper— Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request

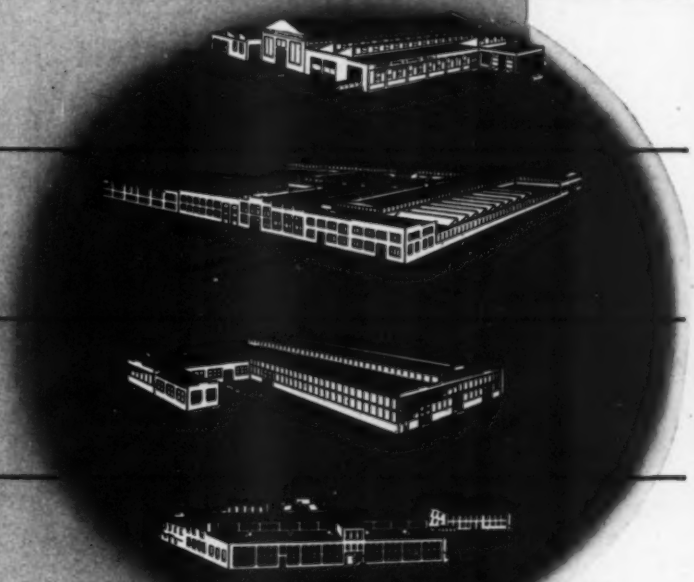
F. C. HUYCK & SONS · *Kenwood Mills* · ALBANY, NEW YORK

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

TO THE USER OF FABRICATED PIPING

4 PLANTS *Are Better* THAN 1



There are four Midwest pipe fabricating plants located in different parts of the country, because Midwest has found that "four plants are better than one" for the user of piping.

In addition to shortening shipping distances and making for a better understanding of the customers' individual problems, four plants provide other important benefits in which all Midwest Piping users participate.

Extra reserve capacity is provided for the emergency job. If extreme speed is sufficiently important, a job can be divided among two or more plants. An overload in one plant often can be handled by temporarily transferring skilled workers from other plants.

One of the greatest advantages is the continuous exchange of information and experience between staff members of the four plants. New techniques developed in one plant are made known to all. Piping problems which may be new to one plant probably are very familiar to another where the "know how" information is available at once. Friendly rivalry—constant study of piping problems by four organizations—tends to advance the art of piping fabrication much more rapidly than would otherwise occur.

All of this works to the advantage of piping users —four plants are better than one.

Midwest can give you better piping and better service . . . whether you need only a simple bend or the most elaborate piping job completely erected and ready for operation.

MIDWEST **PIPING AND SUPPLY COMPANY, Inc.**

Main Office: 1450 South Second Street, St. Louis 4, Mo.
Plants: St. Louis, Passaic (N. J.) and Los Angeles
Subsidiary: Lumsden & Van Stone Co., South Boston 27, Mass.
Sales Offices: New York 7—30 Church St. Chicago 3—645 Marquette Bldg.
Los Angeles 33—520 Anderson St. Houston 2—229 Shell Bldg.
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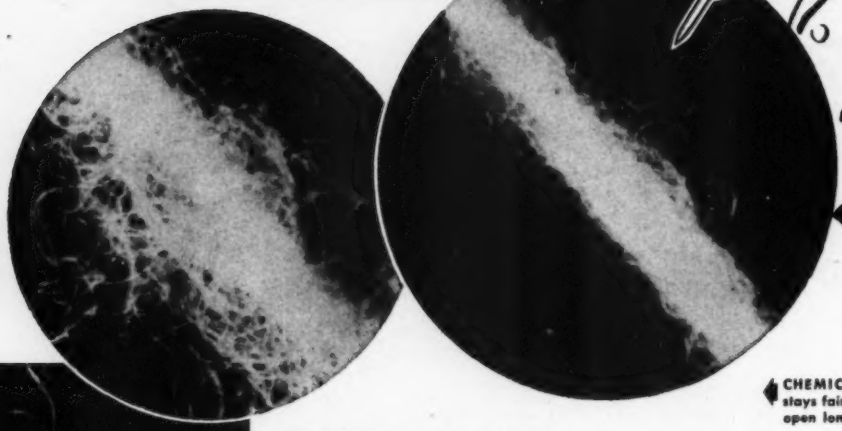
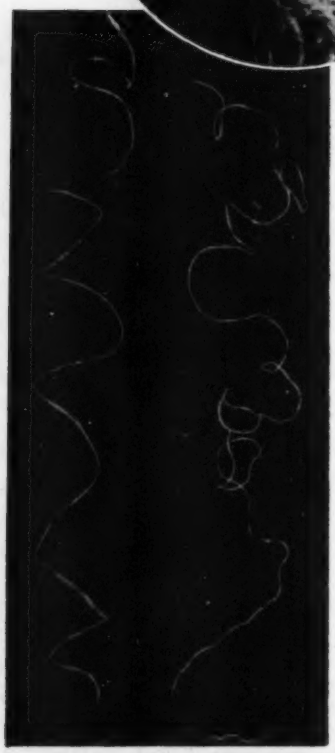
PIPING FABRICATORS AND CONTRACTORS

WHY ORR-CHEMS WILL SAVE A MILL MONEY



CHEMICALLY-TREATED wool yarn stays fairly straight and in a felt stays open longer; hence, better drainage.

UNTREATED wool yarn tangles and fluffs, which leads to early matting and slower drainage.



Get the significance of that! In the average mill a 25% felt saving would total thousands—a felt saving of 50% to 100% could mount to tens of thousands of dollars.

Doesn't such a possibility excite your interest and impel you to action? Wouldn't you like to read what scores of superintendents now using Orr-Chem chemically-processed felts have to say?

• *Write the Orr Sales Department or call your Orr representative.*

THE ORR FELT & BLANKET CO.

PIQUA, OHIO

SINGLE STRANDS. Left, treated and fairly straight. Right, untreated and badly curled. In a felt the straighter the strands the more open the felt and the better the drainage.

ORR-CHEM CHEMICALLY PROCESSED **ORR FELTS**

WET AND DRY strength qualities in paper have found another important field of application by the plastics industry for laminating paper stocks. The fact that lightweight saturating paper now can be wet-strength treated during the paper manufacturing process with PAREZ Resin 607 without loss in absorption ability, means that aqueous resin solutions or dispersions can be used as saturants without troublesome breaks in the stock as it passes through the saturating bath.

The stronger, tougher qualities that PAREZ Resin 607 imparts to paper are finding widely diversified "end uses" . . . such as durable wet-strength paper tablecloths and napkins, window shades and draperies . . . locker papers and wiping "cloths" . . . in all of which the improved tensile and bursting strength . . . improved fold endurance and wet strength have enhanced the usefulness of paper in general.

If your business is paper, consult Cyanamid's Technical Service representatives on how to apply PAREZ Resin 607 to improve the utility and salability of your products.

WHEN PERFORMANCE COUNTS . . . CALL ON CYANAMID

Industrial Chemicals Division AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Washington. In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto.

†Trade-mark of American Cyanamid Company covering its synthetic resins for use by the paper industry. The processes under which PAREZ is applied in the production of wet-strength paper are covered by U.S. Patents Nos. 2,291,079, 2,291,080 and 2,345,543 and U.S. Patent Application Serial No. 453,032.

For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL® Demineralizing Units.

®Reg. U. S. Pat. Off. ©Trade-mark

UNION PACIFIC

TREASURE MAP OF INDUSTRY

* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

Colorado*

Colorado offers industry many desirable sites for manufacture, distribution, warehousing, and other purposes. It is strategically located for national distribution.

Diversified agricultural products are of high quality due to favorable climate and soil.

More than 250 useful metallic and non-metallic minerals and compounds have been found, including precious uranium. Timber, oil and coal are practically unlimited.

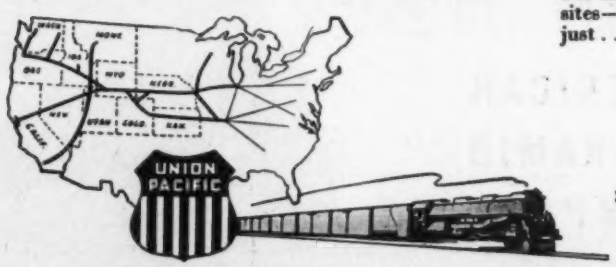
Native-born skilled labor, and a healthful climate resulting in fewer "time-outs" assure economical production.

Colorado provides sound state economy, modern educational and cultural facilities.

Thousands of vacationists enjoy its mountainous splendor, cool summer breezes and winter sports.

Union Pacific provides Colorado with unexcelled freight and passenger transportation. Every night, over night Streamliner service between Denver-Chicago . . . Denver-St. Louis.

For assistance in securing industrial and commercial sites—and for all-weather, dependable rail service, just . . .



be Specific – say "Union Pacific"

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

What America Needs Is More Production

▸▸▸ OUR CENSUS EXPERTS tell us that the population of the United States is increasing at an amazing, unprecedented rate and that this upsurge will continue up into the nineteen fifties. It is this growth in population that underlines the continuous expansion in consumption of consumer goods.

All too little attention has been given to means of providing the volume of goods necessary to feed, house, clothe and equip this growing army of consumers.

The 36 million buyers in this country, the housewives of the nation who make daily purchases of their needed supplies—besides, they buy 90 per cent of the goods their men need—know they cannot have 1941 prices on the basis of 1947 costs. So they have kept right on buying, but insisting for better qualities for their money. In effect, they have been saying, "We are accepting the present price basis as an integral factor in our postwar standard of living."

We believe commerce and industry should heed this decision.

Too much time and attention has been given to reconversion which relates to the status quo ante (prewar conditions) and too little provision made for the status quo (postwar conditions).

What is being done in the way of building new mills, new factories, new and expanded producing agencies to meet this mounting demand for more and more consumer goods? *This demand must be met.* Not only must we meet this domestic demand, but we are just now awakening to the fact that we must meet the demands of the rest of the world for all the goods necessary for its rehabilitation.

Commerce and industry should address themselves immediately to the herculean job of providing more goods for this constantly increased consumer acceptance.

We don't know how great a sum is required for investment by all the divisions of industry. It is huge. We have calculated that to meet the potential demand for paper in 1950, the paper industry will require the investment of some $950,000,000.00 in new paper mills, and equipment, exclusive of woodlands.

Paper is made for people. More people demand more paper. So, with the amazing growth of population scheduled for years to come, and provisions for meeting that increase, static and hesitant, what's the answer?

Increasing shortages of goods and higher prices.

And that goes for all other industries in the whole galaxy of producers everywhere.

Now, let American factories get busy and produce more goods. Increased production is the one sure economic way in which to prevent higher prices and the only way to effect reduced prices.

Paper, Printing and Ink

▸▸▸ THE NEED FOR CLOSER technological contact between manufacturers of printing and lithographic papers, ink makers, printers, and lithographers, has been talked about for years. Yet comparatively little has ever been done about it.

Apparently, most papermakers are content to make paper; most ink makers, to make ink; and most printers and lithographers, to take what paper and ink they can get, or actually specify, and to howl like fury when a job goes wrong—blaming it on the ink or the paper, or both, and probably seldom placing the responsibility for failure upon their own lack of technological know-how of the two basic raw materials of their craft.

How many technical men and production executives with mills making printing and lithographing papers have done any more than to get a smattering of information about the end-use of their products? How much do most of these men know about inks and their application to paper? Also, in general, how much information does the ink maker, the printer, or lithographer have about the many manufacturing variables in the making of a sheet of paper.

Can the problem be approached from another angle? How many paper-makers, printers, lithographers and ink makers study the literature of the related industries? How many of these men, outside of business contacts, "hobnob" with one another as friends or for the good that might come from such companionship in convention meetings or other gatherings. For the most part, observation points to each of these groups as going its own individual way. Papermakers conventions at least are held time after time with no representative of the printing or lithographic craft on the programs and probably few or none in attendance at the various sessions. Similarly, papermakers probably are conspicuous by their absence from meetings of the printing craft and of ink manufacturers.

If there ever was a time when papermakers, printers, lithographers and ink makers should have a better understanding of the problems of each other, it is now. What will the paper industry do about it?

CURRENT THOUGHT

Saving the World by Economics

WILLIAM SIBLEY

▶▶▶ IN MY OPINION David Lawrence is one of America's leading economists. He airs his views through the press, radio, and the "United States News." Not long ago he presented a clearly cut "Economic Plan to Save the World." This plan is so neat, so logical, so painless and so profitable it is worthy of everyone's study. Hence, the digested version of it here:

He said his plan in no way involves armaments.

It doesn't mean war with Russia or anybody else. In fact, it doesn't involve any sacrifice of human life. In that respect it is inexpensive and bloodless.

"To make the plan work does require, however, vision and realism and, above all, commonsense leadership in our own country and abroad.

"It is not a new plan but a revival of long-established principles of peacetime commerce.

"It is, in its essence, a plan to direct the flow of the dollars of the world into the channels of investment. It means loans—not by governments but by individuals. Peoples must become informed and must understand how with their own private resources they can reconstruct a war-torn world.

"There are no revolutions where the people have food and employment.

"Dictatorships cannot survive where there is high productivity, a decent standard of living and a trend away from the state controls born in emergencies.

"The distress in the world today is not confined to backward areas or to dictatorship countries. Britain and France, for example, are in dire need of economic help. They are struggling with postwar imbalance. Their peoples are thrifty and hard-working. They are honorable, democratic peoples.

"The solution for their economic difficulties, however, is not more grants or loans from the United States Government to Britain and France except perhaps small stop-gap loans till the larger machinery of private lending is set up. The United States Government itself cannot keep on lending, and yet American prosperity depends on the prosperity of the rest of the world. Thus, our farms and factories are selling about $8,000,000,000 a year more goods than we are buying from other countries.

"This gap cannot be financed indefinitely by government loans or gifts. We must buy as much as we sell—the two things must come into balance some day.

"We must look back into the pages of history. How did the people of the United States build their railroads, beginning in the middle of the last century? They built them because British and French and Belgian and Dutch and Swiss and German investors sent their funds to America. It is true these investors lost periodically. Some railroads were built too rapidly for the demand in their areas, and receiverships and bankruptcies wiped out the investments of many of these foreign lenders. But the foreign lenders were not daunted. They invested in our other enterprises and came back to help railroads again. They helped us build our electric light and power plants, our street railways, and for many years they were substantial holders of our securities.

"Now it is we of America who have the funds. Will we be realistic and courageous, too? Will we have confidence in the future of the other peoples who show initiative and who can be guided by the successful and tried methods of private enterprise?

"It is apparent that unless private investors come to the rescue, socialistic government will multiply and the way will be open to dictatorships.

"But, it will be asked, didn't we make private loans in the 1920's? We did, but we didn't keep up the lending long enough and hence we lost some of our initial investments. This fact has now been attested by economists who have analyzed the finances of that period. We abruptly pulled out the support from beneath Europe when our own economy went haywire in 1929. From then on, Europe suffered as we suffered. Then we not only spent more than $300,000,000,000 but we tragically spent the lives of our young men—a sacrifice that would have been averted if we had used a small number of our dollars to prevent disaster.

"We cannot overnight stabilize the world economy. We must make some grants and some loans through governmental channels for another year or so. But the larger plan—the lending of private dollars—must be instituted at once, so that the whole world can see and understand now the means of rescue that are being devised to restore peace and economic balance.

"This whole approach, of course, is not new. Such reasoning was behind the plan for the establishment of the International Bank for Reconstruction and Development. The World Bank has a potential capacity for lending of $8,000,000,000. This is not enough.

"There must be private lending in addition. Thus, Norway recently borrowed $10,000,000 from private investors in the United States, indicating that such loans are practicable. There must also be a cooperative attitude on the part of other nations in the removal of restrictions on the introduction of capital into their countries.

"Private lending in the next three years can support the world economy and give it a real start toward self-adjustment. It would underwrite the energy of human beings everywhere. It would underwrite peace.

"Let it not be forgotten that during the war we distributed into private hands, apart from lend-lease, about $290,000,000,000. A major portion of that expenditure still exists as a money supply. Let it not be hoarded now when it can save the world.

"Will we ever be paid back? The history of foreign loans shows that there are, of course, losses in private lending, but when the interest income and the annual payments on principal of the bonds are added up over a period of years, the percentage of loss averages pretty well alongside of any other kind of lending amid the hazards of domestic enterprise.

"What we are doing in Greece and Turkey is political in the sense that we want to prop up the economic structure of those countries and stop the Communists at the same time. But the real way to stop communism is to strengthen capitalism. That means the courage to lend dollars and build up the businesses of countries which can become our best customers.

"The world can be saved if we have the courage to build a strong economic association. With such a foundation, the United Nations can solve almost any political problem that will ever arise to threaten the peace. Give us economic security everywhere and the atom bomb will never need to be used again, because everywhere there will be political security."

INCIDENTS IN SMITHway PRESSURE VESSEL RESEARCH

PROJECT No. MS-2305

How to know in advance that a pressure vessel will meet all stress requirements

FOR a hundred years the most common problem of all pressure vessel engineers has been to *know in advance* the stresses which will be developed at critical points in service.

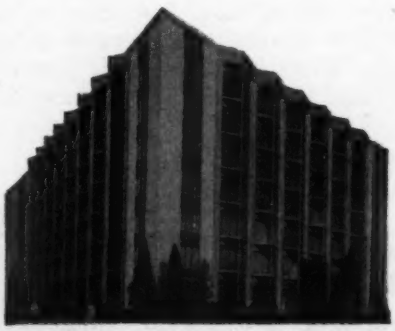
At many critical points, designers were obliged to depend upon empirical formulae. In the past 20 years much data has been gained from destruction tests. Recently methods have been developed to arrive at stress analyses by non-destructive tests.

Extensive experience in A. O. Smith laboratories with these aids has made it possible to guide effort most rapidly and accurately in the direction of ideal design.

For example, in Project MS-2305, it was vital to avoid dangerous stresses at critical points where calculation was difficult if not impossible. Through the use of more than five years experience with the SR-4 strain-gage it was possible to determine that the new design would successfully withstand the incalculable stresses.

This experience and equipment is available to guide future vessel design involving stress problems in complicated structures.

Taking SR-4 strain-gage readings during testing of field-erected vessel.



A. O. Smith Research and Engineering Building, Milwaukee

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MAKERS OF AUTO FRAMES • PRESSURE VESSELS • LINE PIPE • OIL-WELL CASING • BREWERY TANKS
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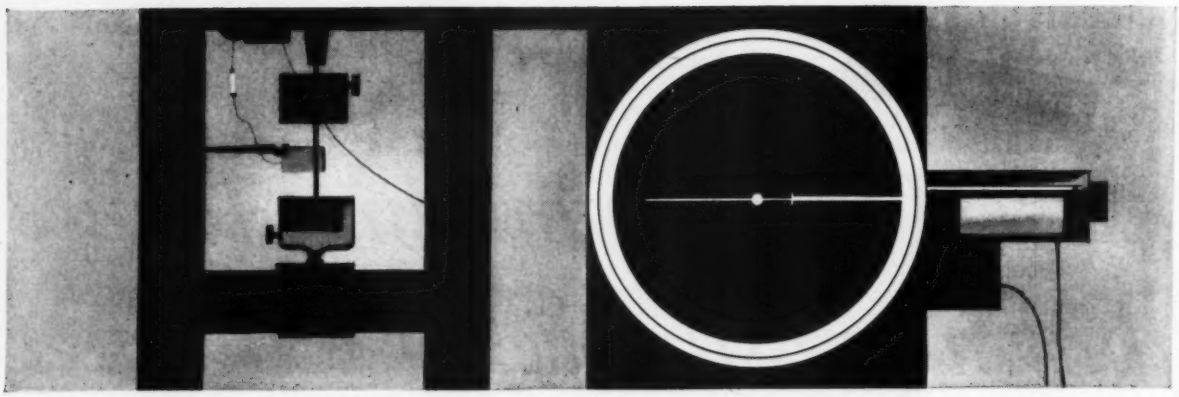

high strength paper

\+ No. 5013 PLYOPHEN

= amazing tensile strength

Fabricators report exceptionally fine results from the use of No. 5013 Plyophen varnish with high strength paper. It cures perfectly with this type of stock at pressures from 150 to 250 lbs. and, with the addition of small amounts of caustic soda, the curing cycle may be reduced to as little as 5 minutes. As delivered, No. 5013 consists of 60% resin and 40% solvent, but exceptional tensile strength can be achieved with only 32% resin content, resulting in genuinely low cost production. No. 5013 is also useful in low-pressure bag molding, as a filler sheet varnish in the production of decorative laminates, as an impregnating agent in the manufacture of plastic-faced plywood. Details on its wide usefulness and distinctive properties may be obtained by writing direct to the Sales Department at Detroit.

REICHHOLD CHEMICALS, INC.

RCI

General Offices and Main Plant, Detroit 20, Michigan

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SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

This Screen and Filter Cloth really stops trouble

Give your filtering and screening jobs to wire cloth made of Monel*, Nickel or Inconel*.

For these are the "task metals" of industry.

Compare them with any fabric or metal cloth that is causing you trouble now. Wire cloth of these metals is rustless . . . corrosion resistant . . . strong . . . tough. It endures high temperatures. It stands abrasive wear. Your product is safe from contamination at all times.

Longer-lasting wire cloth of Monel, Nickel and Inconel is available in all weaves and meshes. Its range of usefulness is as wide as the range of tough tasks industry has to offer.

Many weaves actually cost less than cloth of less durable metal. Consult any quality weaver of wire cloth. Tell him your filtering or screening problem. He'll be glad to quote prices on the cloth or screen to fit your need.

If you don't know a nearby weaver, send for our booklet: "Established Weavers of Monel, Nickel and Inconel Wire and Filter Cloth."

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York 5, N. Y.

INCO TRADE MARK

Monel* Nickel Inconel*

*Reg. U. S. Pat. Off.

"Task Metals" for Industry

Since 1846

Powell Valves have served Industry

...and served it well.

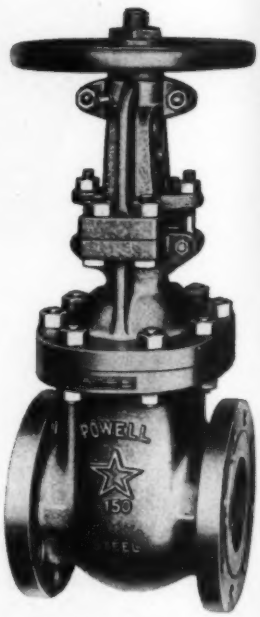
Small size 200-pound Bronze Gate Valve for steam, water, oil or gas. Has inside screw rising stem, union bonnet and renewable, wear-resisting "Powellium" nickel-bronze disc.

'Way back in the "horse and buggy days", the first regrinding globe valve was produced and patented by Powell. And ever since then Powell has been a leader in the field of industrial flow control equipment.

As amazing as the changes in methods of transportation have been since 1846, the progress of industry has been well nigh incredible.

Through more than a century of keeping pace with the flow control requirements of each new industrial development, Powell has built such a complete line that today there's a Powell Valve to meet every demand of modern industry.

The Line now includes Bronze and Iron Valves of every required type, design and size; Cast Steel Valves of every type, in pressure classes from 150 to 2500 pounds, inclusive. And, to meet the demands of the Chemical and Process Industries for corrosion resistant valves, Powell makes a complete line, including many special designs, in the widest range of pure metals and alloys ever used in making valves.



Class 150-pound Cast Steel Gate Valve with bolted flanged yoke, outside screw rising stem and taper wedge solid disc.

Large Iron Body Bronze Mounted Globe Valve for 125 pounds W.S.P. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron.

The Wm. Powell Company, Cincinnati 22, Ohio

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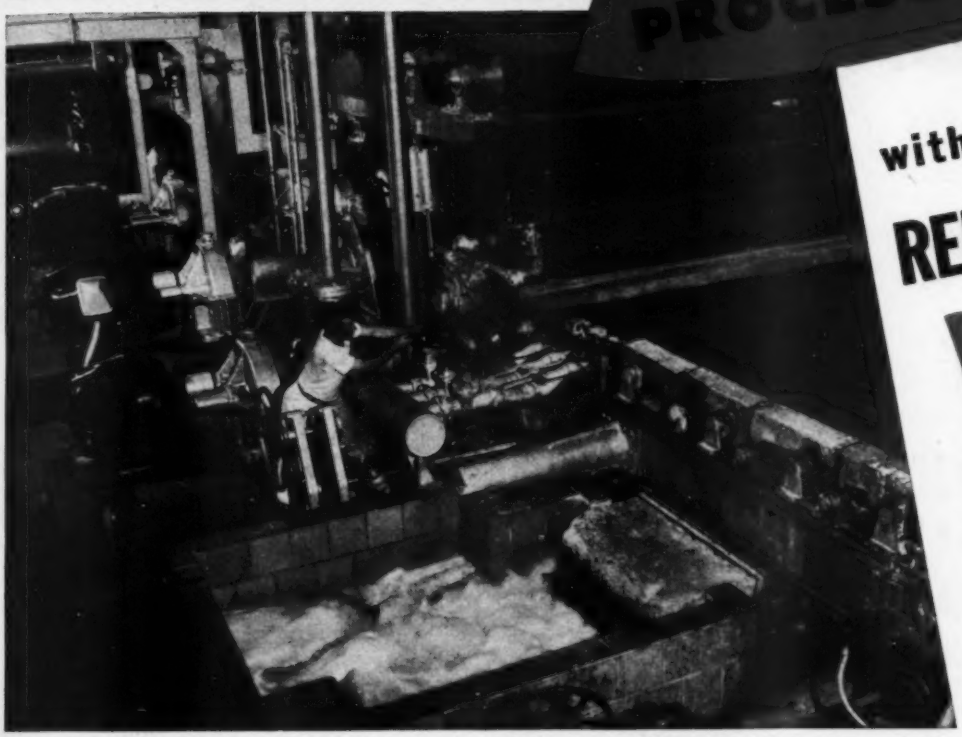
POWELL VALVES

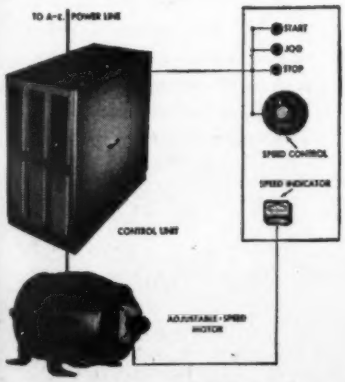
Unlimited FLEXIBILITY FOR All PROCESSING—



with RELIANCE V★S DRIVE

V★S Multi-motor System maintains required tension throughout the pick-up felt of this Modern High Speed Tissue Machine.

RELIANCE V★S DRIVE



Conveniently-packaged, space-saving V★S Drives are available from 1 to 200 hp.

Quick, smooth starting and stopping, stepless speed changing and maintenance of proper tension are handled by the *All-electric, Adjustable-speed Drive* right from your plant's A-c. circuit. Through automatic or manual control—at the machine or from remote stations—Reliance V★S Drive brings unlimited flexibility to any processing operation. Thousands of installations are proving every day that V★S on the job means greater production and lower costs. That's why it will pay you to write today for Bulletin 311-A which contains more important facts about V★S Drive.

RELIANCE ELECTRIC & ENGINEERING CO.

1078 IVANHOE ROAD • CLEVELAND 10, OHIO

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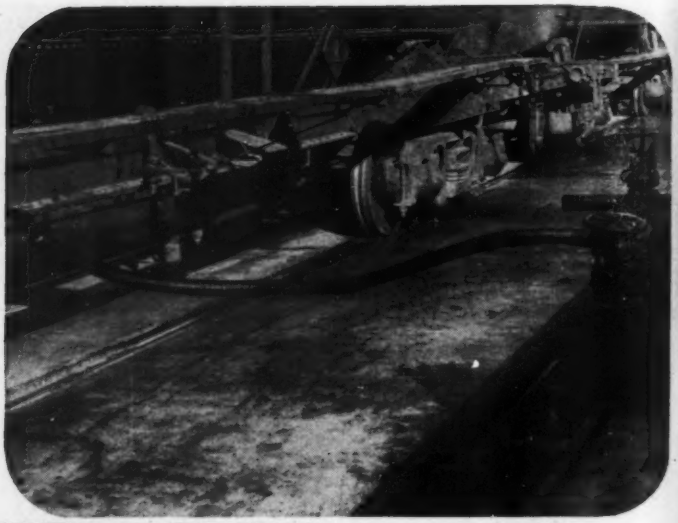
RELIANCE A-C D-C MOTORS

Load or Unload . . . REX-TUBE *does both . . . better!*



● REX-TUBE, Type RT-15, is the rugged, "made-to-order" interlocked flexible metal hose for working assignments like those shown above. Steel (or bronze) RT-15 is the standard flexible metal unloading hose. In addition to loading and unloading operations, it is widely used for *handling steam at low and moderate pressures; dispensing bituminous and other "hot" processed liquids* and other such services where manual usages of flexible metal hose are required.

There are other Rex-Tube types for a wide variety of applications. Sizes range to 12″ I.D. inclusive, with soldered or heat-proof couplings. Send for data sheet.

the science of FLEXONICS

* "The controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion"... is exemplified in the basic products of Chicago Metal Hose Corporation.

CMH CHICAGO METAL HOSE CORPORATION

Maywood, Illinois • Plants: Maywood and Elgin, Illinois

SHARP AS A TACK
. . . AND JUST AS BRIGHT

Sharp, full ink brilliancy is assured with Kelgin*, the modern algin sizing agent. It forms a superior film barrier — perfectly sizes paperboard for printing control and smoothness.

Kelgin may be adapted to water box application in the calender stacks without fear of foaming, picking or sticking to the rolls. It is easy to handle, soluble in both hot and cold water. If your sheets have a tendency to curl, Kelgin will greatly minimize or eliminate this troublesome factor.

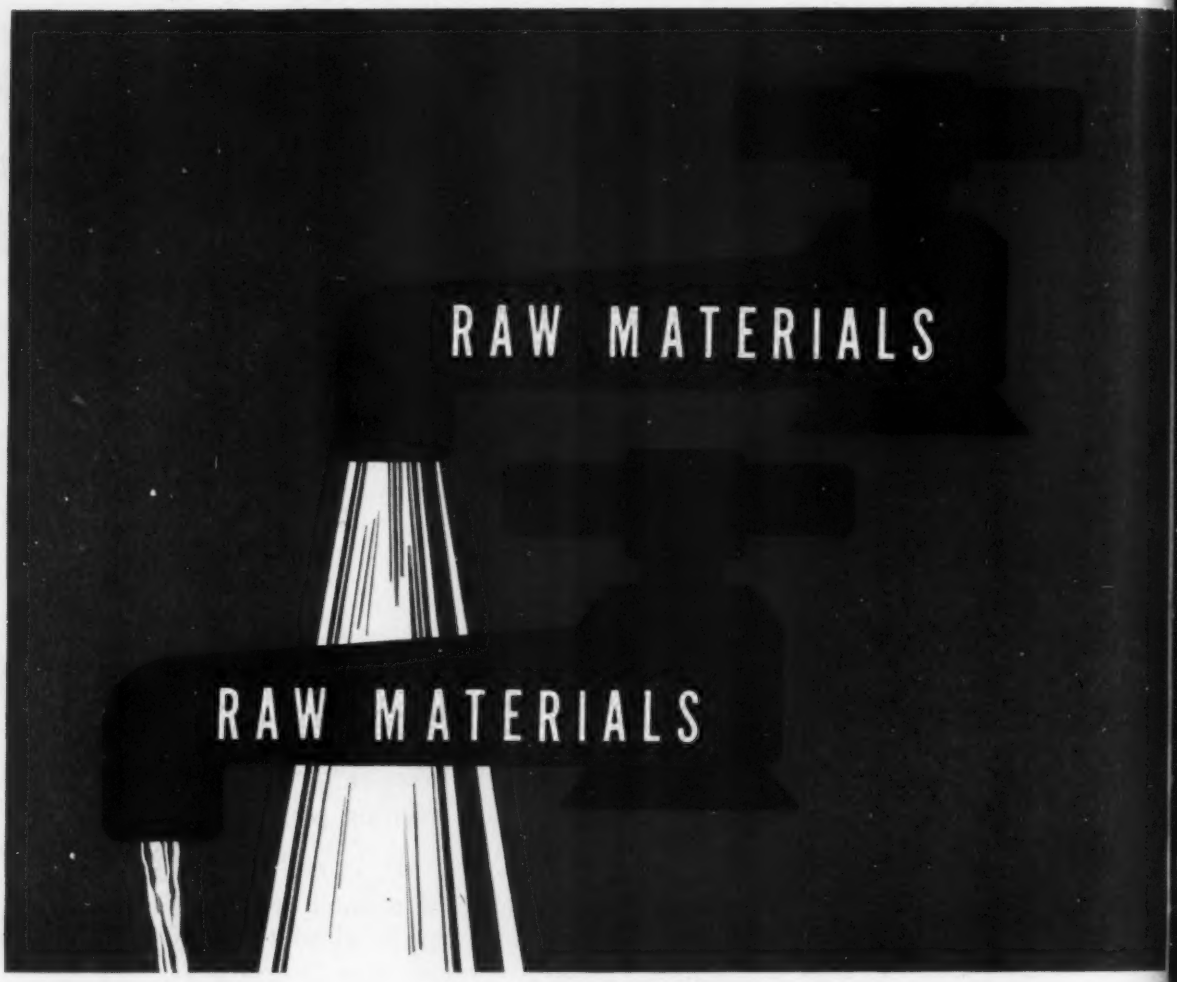
A rigidly processed product of nature that insures consistently uniform results, Kelgin is extremely economical. Our technical department is available for discussion on its adaptation to your specific application.

*Trade Mark Reg. U. S. Pat. Off.

KELCO COMPANY

20 N. Wacker Drive, CHICAGO-6 | 31 Nassau Street, NEW YORK-5 | 530 W. Sixth Street, LOS ANGELES-14

Cable Address: KELCOALGIN—New York



Raw material supplies...
key to new plasticizer production

While the production of new Monsanto plasticizers is largely contingent on basic chemicals now in short supply, these shortages have not deterred the progress of Monsanto's research and field-test activities... On the contrary, greater emphasis is being placed on new Monsanto plasticizers which can be developed around those raw materials that are most likely to be available soonest, in largest quantities. This "product-priority" means that new Monsanto plasticizers will reach a stabilized commercial stage at the earliest possible moment.

Meantime, laboratory research and field tests are being continued on a broad base. Already it is evident that forthcoming Monsanto plasticizers will be far more versatile and adaptable in their application. They promise to set new standards of compatibility, flexibility, volatility, burning rates, heat and light stability, permanence, abrasion resistance, elasticity. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri... District Sales Offices: New York, Chicago, Boston, Detroit, Cleveland, Cincinnati, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle. In Canada: Monsanto (Canada) Ltd., Montreal.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS AND PLASTICS

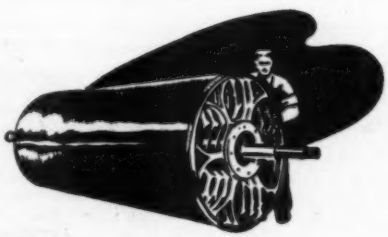
Present Monsanto Plasticizers

Aroclors*	Santicizer* 8
Dibutyl Phthalate	Santicizer 9
	Santicizer B-16
Diethyl Phthalate	Santicizer E-15
	Santicizer M-17
Dimethyl Phthalate	Santicizer 140
HB-40	Triphenyl Phosphate
Ortho-Nitrobiphenyl	Tricresyl Phosphate

SERVING INDUSTRY . . . WHICH SERVES MANKIND

BORING

WITH PRECISION



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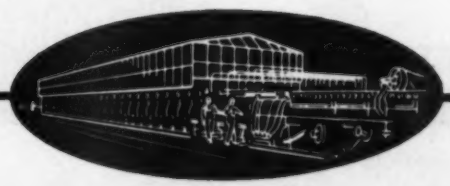

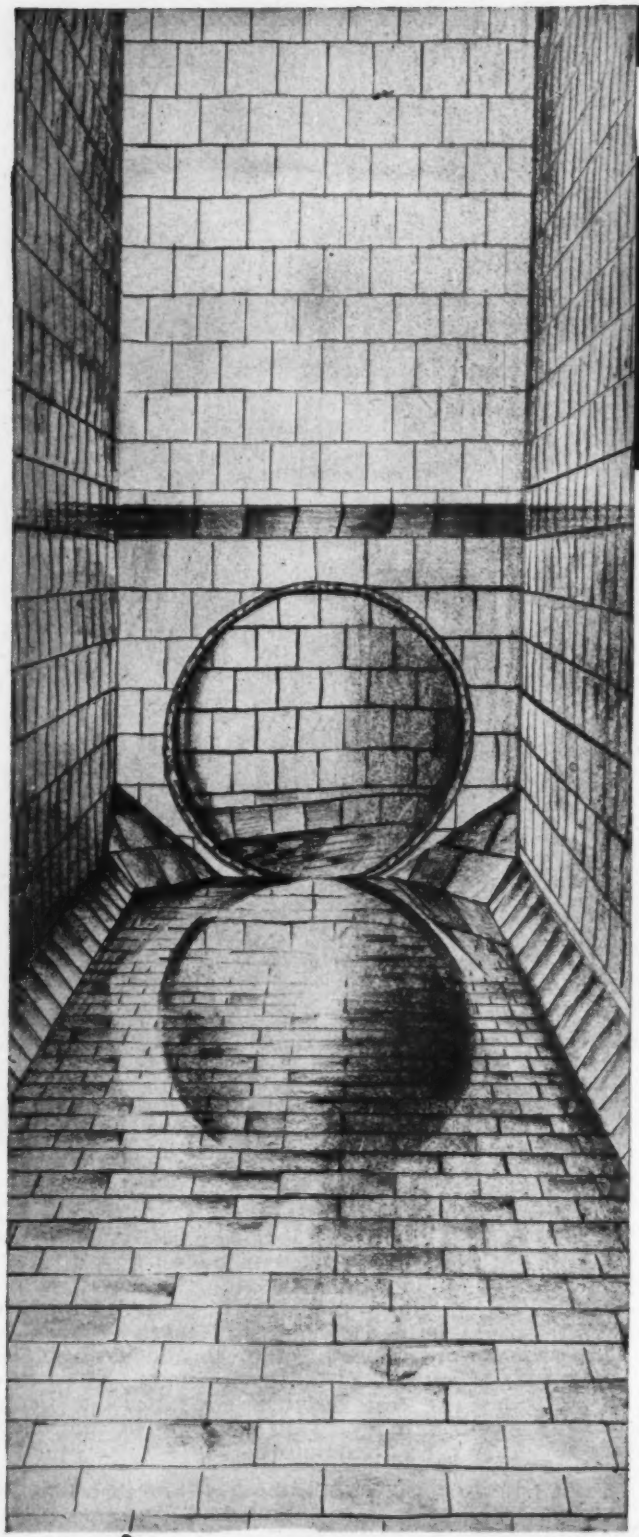

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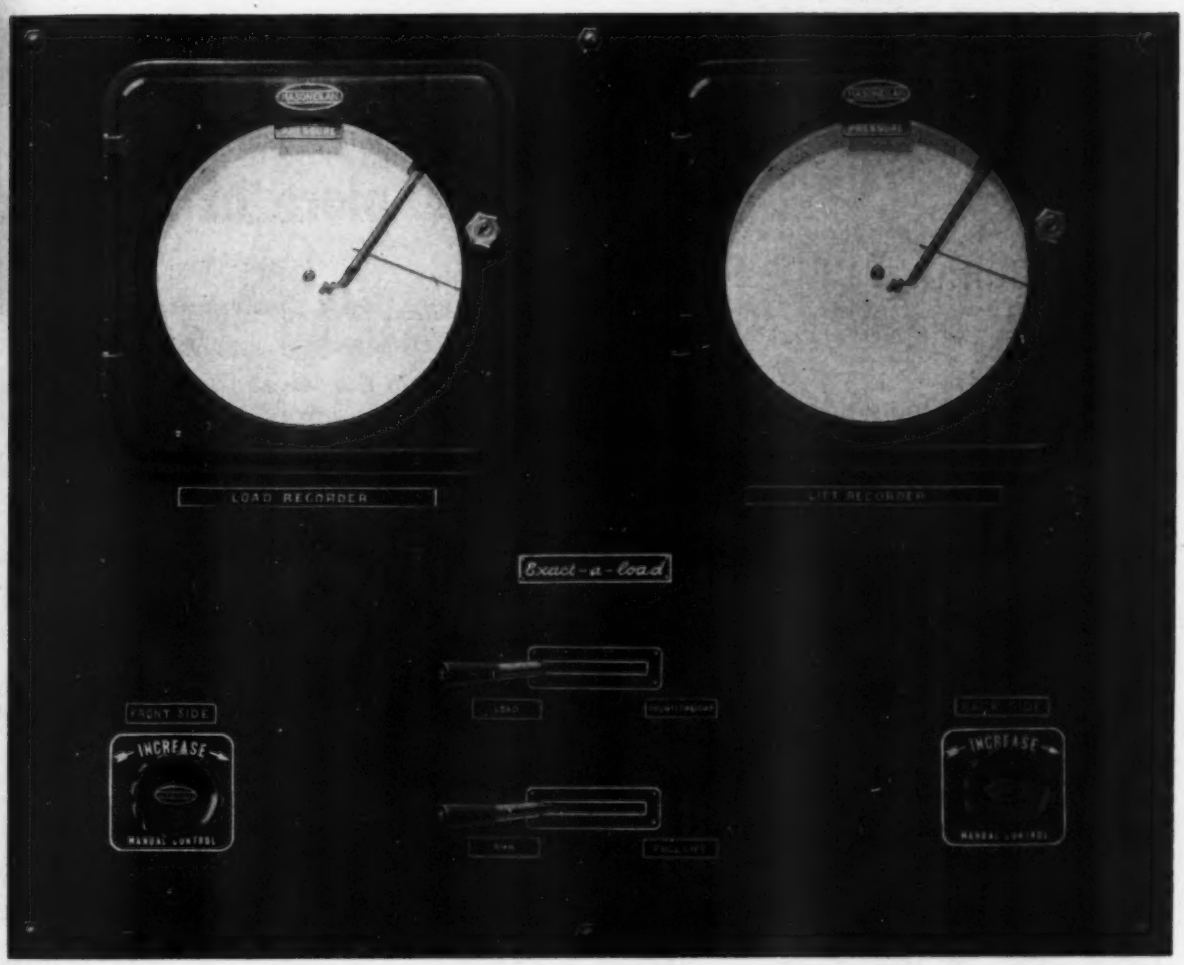

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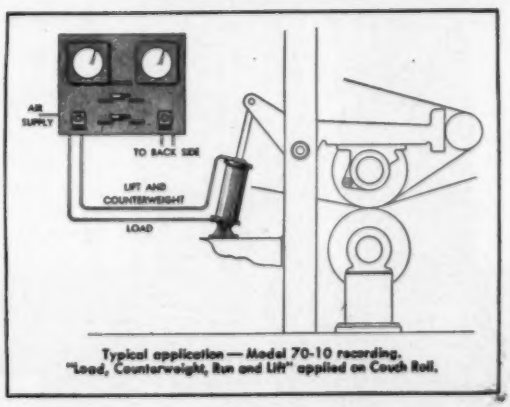

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THE PAPER INDUSTRY
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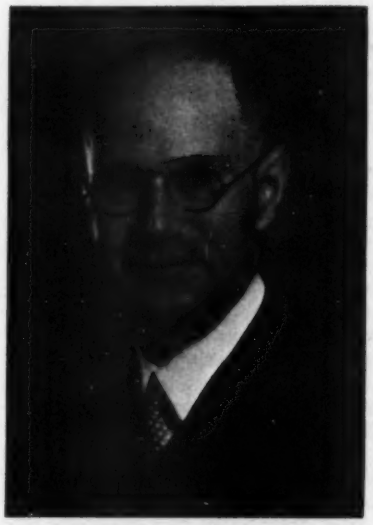
JUNE, 1947

What Do We Know *about* Beating?



EDWIN SUTERMEISTER

THE ORIGINAL METHOD for preparing fibers for papermaking was that of the Chinese who placed bark or cloth in a stone mortar with a little water and pounded it with hand-operated pestles or mallets until the fibers were sufficiently separated. Later, the Chinese and Arabs both used trip hammers operated by workers treading on the ends of horizontal tilt-bars which raised the hammers and allowed them to fall heavily on the material being treated. This saved much labor, but for hundreds of years after it had been invented by the Arabs, the older method of hand beating was continued in China and Japan. Even to the present time, the remote handmade mills in China, Korea, and Japan prepare their fibers by wetting the cleaned bark, placing it on heavy stones and pounding it with wooden clubs or mallets.

In the early stamp mills, the mortars frequently were set in the ground. Since the amount of water used in Oriental stamping was about four times the weight of the rags, there probably was little or no actual splashing from the action of the stampers. The stampers in early use in Europe probably weighed about 60 to 70 pounds—assuming they were made of oak and were nearly saturated with water, and also including part of the weight of the tilt-bar which would aid in their fall. The European type of stampers had a drop of eight to twelve inches, depending on the particular mill.

Beating in mortars and stamp mills was aided greatly by boiling the bark or bamboo with lime, or allowing it to soak with lime for several days; the Arabs probably disintegrated linen rags by saturating them with water, piling them up, and allowing them to ferment, after which they were boiled with wood ashes and washed in bags in running water. Such fermentation processes caused large losses, because much of the material was rotted beyond the useful stage, but the remaining good portion was tender and easily reduced in the stamp mills. One can only surmise as to the strength and durability of the fibers which finally found their way into paper; it would seem that their strength must have been impaired seriously if any considerable portion of the fibers had been so badly rotted as to be useless.

The fermentation treatment varied with the quality and quantity of the rags used. Coarse linen broke down more quickly than finer grades, and new material more rapidly than worn clothing. Action was more rapid in large piles than in small ones, which did not retain their heat so well. When slight traces of fungi showed on the piles, it was considered that the process was taking place satisfactorily. Lime was sometimes added to the fermenting rags to assist disintegration, but it was thought that the paper made from such fibers was not as strong or as permanent as that from fibers which had been fermented naturally, and in France in the eighteenth century the use of lime was prohibited. The fibers prepared by fermentation were not white, but produced paper with a creamy tone.

Another ancient method of beating was by means of stone rolls very similar to kollergangs in their action. These were operated by animal power, but because of the scarcity of food for the animals this procedure necessarily gave way to the manually-operated stamp mills.

About 1151, a stamp mill operated by waterpower was invented in Spain. The linen and cotton fabrics of the period were ideal for papermaking because they were uninjured by chemicals or bleaching. When materials of different weights were to be used they were usually stamped separately and mixed afterward; otherwise much of the fiber from the weaker and more easily disintegrated fabric would be lost with the escaping water before the coarser and tougher fabrics were well reduced.

The water-driven stamp mills of Spanish origin consisted of rows of great, wooden hammers which operated up and down in troughs called "vat holes," which were made from blocks of stone or from oak logs with the cavities lined with iron or lead. With the exception of slight changes in size and arrangement of the stampers, this general method of preparing stock remained unaltered for many centuries.

Toward the seventeenth century

stampers were slightly different in construction according to the work they were to do. For the first treatment of the rags the stampers were shod with iron teeth or spikes which effectively frayed out the cloth. During this treatment, a stream of water was run through the troughs to carry away dirt through overflow holes in the sides of the containers. These holes were covered with horsehair screens to retain any separated fibers. After the rags were partly cleaned and broken down they were bailed out to a second stamper where the process of washing and stamping was continued, but with a more lightly shod stamper. The final treatment was in a third set of stampers, usually without metal facings, and without running water, which, at this stage would have carried away too much of the well separated fiber.

The number of stampers in a plant naturally varied with the quantity of paper which was produced, but early in the seventeenth century a good German mill was said to have as many as twenty-five troughs, each with four stamps. The early American mills, notably the Willcox mill in Pennsylvania which was established in 1729, utilized stampers for the maceration of their rags. It is not known when their use ceased in this country, but they probably remained in use until about 1780, and to a rather later date in Europe.

The essential action of the stampers was to pound and fray the material, and the fibers were shortened very little, and then probably only when the pressure of the fibers on each other under the weight of the stamps caused some of them to be pinched off. The chief result of beating was to fray the ends of the fibers and in places split them in the direction of the length of the fiber. It is claimed that this type of beating, together with the absence of alum and other chemicals in the paper, largely was responsible for the remarkable strength of the papers of this period.

There is just a possibility that this appraisal of their durability and quality may not apply to all papers made during this period, but only to those which have survived. An anonymous writer (*1*) states in regard to papers in Holland, that an edict published in 1530 prohibited the importation or sale of any paper both sides of which could not be used without the writing becoming illegible because of penetration of the ink. Heavy penalties were prescribed. Again, in 1670, the Dutch archives are quoted as saying that papers (presumably of Dutch origin) perished rapidly, cracked wherever folded, and after having been carried in a folded state for a few days could be rubbed to fragments between the hands. French-made papers, of the same period, remained in good condition under similar circumstances.

Considering the great length of the fibers employed in many of these old papers, the formation of the sheets is remarkably uniform and not nearly as "wild" as would be expected. The comparative freedom from shives and large fiber bundles is also noteworthy.

In order to see how beating with stampers affected the fibers, several old papers were obtained through the courtesy of Dr. Dard Hunter, and examined microscopically.

1. *A Chinese paper of* 1488—Soft, relatively thin and weak; a laid sheet of fair opacity for its weight. Good formation and very few fiber bundles, indicating relatively complete maceration. The fibers are smooth-walled with sharply pointed ends, and the beating treatment has not split them or roughened their surfaces to any extent. Large pitted cells and small oval ones indicate that this is bamboo fiber.

2. *European paper of* 1486—A very uniform, laid sheet of high opacity, with practically no shives or fiber bundles. Apparently all linen, but only an occasional long fiber is present and most of them are much shorter than most rag stocks treated in modern beaters. It is probably shorter than the average fiber from such woods as poplar, beech, and maple. Nearly all the short pieces are split into fibrillae and some show ends cut or broken sharply across. Since this was made before the invention of the Hollander, it would seem from the shortness of the fibers that they must have been made very tender and brittle by fermentation of the rags prior to beating.

3. *Japanese paper of the 15th Century*—A thin, hard, rattly, translucent product, showing numerous fiber bundles. The fibers are long and slender, and in some instances show slight lignification. They are not split, but have become considerably fibrillated on the surface through the action of the stampers.

4. *Persian, 18th Century (Possibly Kashmir, N. India)*—A hard, rattly, very smooth and rather translucent sheet, of a very uniform formation. The fibers are linen and are beaten very much like those in the European sample of 1486, though they probably average a little longer and are more completely split.

5. *Chinese, 16th Century*—A very thin, silky, highly translucent, porous sheet resembling modern "lens paper" in appearance. The fibers are very long and of greater width than the bamboo fibers in the Chinese paper of 1488. The fiber surfaces seem to have a natural roughness, but there is no splitting of the individual fibers and no visible evidence that beating has fibrillated their surfaces.

6. *Chinese, about* 1700—This is apparently a bark fiber, capable of splitting lengthwise. The fibers are very long and broomed out at the ends, but there are no sharply cut fragments. There is considerable debris, which seems to come from the ends, rather than from the sides, of the fibers. They do not seem to be appreciably roughened or fibrillated by the beating treatment.

It is of interest to note that of these samples only No. 4 contains starch. Samples 3, 4, 5, and 6 are well sized to writing ink, but samples 1 and 2 feather badly where it is applied. Since Illig is credited with being the first to use rosin and alum as sizing agents in 1806, it is evident that prior to that date other sizing agents were in use which rendered the papers resistant to modern writing inks.

Hollander Beating

In the latter part of the seventeenth century — approximately 1680—some Dutchman (whose identity has been lost) conceived the idea of beating stock in a device consisting of a tub with rounded ends, in which revolved a solid roll, made from a tree trunk, on the surface of which there were fixed about thirty iron knives. This roll revolved over a metal or stone bed-plate placed in the tub directly under the roll. The turning of the roll dragged the material between the knives and the bed-plate and forced it up and over a backfall, down which it slid to complete its circulation around the tub. This is essentially the type of beater in use today, and it is still known as the "Hollander" because of the country of its origin. Its use made fermentation of the rags unnecessary and some mills washed and beat them without any preliminary treatment.

Hollanders were known to be in use in Germany as early as 1710, and in 1725, one Hollander was said to produce as much stock in one day as eight stamper holes could prepare in eight days. Even after the introduction of the Hollander, many European mills continued to use the stampers for breaking down the rags, and finished the beating in the new apparatus. The gradual change from one type to the other is well illustrated by a German mill, which in 1716 worked twenty-five sets of stampers of four each; in 1777 this same mill had thirteen sets of stampers and three Hollanders; in 1829 eight sets and four Hollanders.

During all this time, the same four dipping vats were supplied with stock.

By the year 1800, all but one of the English paper mills had discarded the stampers. The French were still slower to make the change, and until 1861 the French government insisted that all paper made for the Stamp Office be prepared from fibers beaten in stampers. This was to insure longer fibers and stronger and more durable paper. If they also had specified a good grade of rags, and a mild treatment before beating, this regulation might have produced the desired result, but as is shown by the microscopic examination of two of the samples previously mentioned, the mere use of stampers does not guarantee long fibers in the paper.

Hollanders were used in America at least as early as 1775, for two were installed in the Burbank mill, the first mill in central Massachusetts. These had rolls 26 inches in diameter and two feet long, and supplied the stock for two dipping vats making 4000-5000 sheets per day.

Very little information seems to be available regarding the progressive development of the Hollander for about two centuries after its invention. Apparently the design was not greatly altered and the changes made were chiefly of a minor nature to improve its construction and to increase its size and capacity.

Muspratt (2) mentions rag washers as holding about 150 pounds of rags per charge. In the same volume, beaters are said to have rolls with 54 knives, turning at 150 rpm over bedplates with 20 knives. In Lippincott's *Encyclopedia of Chemistry* (1879), a rag washer is shown as 10 ft. long, 4½ ft. wide and 2½ ft. deep; this had a midfeather and a washer. This corresponds very closely with the length shown in an illustration of a beater of the 18th century (3), but this illustration also shows three beaters grouped about one common driving gear, and these appear to be about 8½ ft. long by 5 ft. wide, and to contain no midfeathers. Even as late as 1888, the trade journals mention the installation of new beaters of 600 pounds capacity. Compared with these, modern beaters of practically the same type vary in length from 18 to 26 feet and the rolls from 36 to 60 inches in both diameter and length of bars. Such beaters may contain up to a ton or more of dry fiber per charge.

This increase in the size of Hollanders has been a natural result of the increased demand for paper, but it is doubtful if it would have gone as far as it has if the use of chemical wood pulps had not been developed as substitutes for rags and other long fibered materials. It may be no coincidence, but until the use of wood pulp became general the size of the beaters remained relatively small, while since then there has been a very marked activity in developing beaters of larger capacities and supposedly superior types. These have included the Horne, Emerson, Umpherston, Rabus, Niagara, and many others, all of which were designed to save power, give increased rates of stock circulation and beat off the stock in less time. It is not the intention to discuss the relative merits of these different beaters, but it must be pointed out that the character of the stock is greatly influenced by the size and type of beater, and that no single kind can be the best for all purposes. Work can be done in a small beater with a light roll which cannot be duplicated in a large beater with a heavy roll, and the reverse is equally true.

Other Beaters and Refiners

Beaters of the Hollander type require large floor space and much power; they do not circulate the stock well at more that 7 per cent concentration; the control of the beating is poor and their action changes with the wear of the knives and the bedplate; also individual beaters of supposedly identical character vary widely in their action on the fibers. While some of those defects have been partially overcome in the newer types of beaters there is still much to be desired, especially in avoiding batch operations, to which they are all subject. This has led to the development of the Kingsland refiner in 1856, the Jordan in 1858 and since then to the Claflin, Marshall, and Wagg, the Fritz Hydrator, the Sutherland refiner, the Bauer fibrator, the Morden Stockmaker, and many others. At first the refiner, as illustrated by the Jordan, supplemented the beater; it was supposed to take stock which had been treated in the beater and cut or shorten it to such an extent that it would give the desired formation and strength to the paper. This function was far more important when beating long fibers such as cotton, linen or hemp, than it is with chemical woodpulps, and today it is difficult to make any very clear distinction between the action of the two—the Jordan merely continues the action started by the beater.

One result of this change of fibers and of the attitude toward beating has been the attempt to do away with the beater entirely and prepare the stock by continuous operation through refiners. Beaters were probably first eliminated in news mills were all ingredients were metered to the paper machine. Today glassine is being made from stock which has never been in a beater, and some of the southern kraft papers are being made in the same way. The use of refiners exclusively would seem to be particularly advantageous in mills making one type of paper continuously, rather than in smaller mills making different grades or specialties, from various types of fiber. It would seem that refiners are designed to make the stock slow or "greasy" rather than to cut it, but some of them are claimed to be suitable for a variety of papers. The use of refiners presupposes that the fibers going to them must be in the slush condition.

Besides serving to put the stock in the proper condition for making paper, beaters are also mixing vats for clay, color, size, alum and other materials which are necessary in the finished paper. Where refiners are substituted for beaters all these materials have to be metered continuously, either into the refiner or into the stock as it goes to the paper machine. This brings up a number of problems as to the proper order of addition and the required time of reaction between materials, and with the fibers before the latter flow to the wire. Such problems are of great importance in papermaking, but do not form an integral part of any discussion of beating.

Literature References

1) Anon., *The Paper Maker*, June, 1942.

2) S. Muspratt, Chemistry as applied to the arts and manufactures. About 1855.

3) Dard Hunter, Papermaking through eighteen centuries (1930).

EDITOR'S NOTE: This article is in two parts; it will be continued in an early issue of this magazine.

How to Evaluate Technical Soya Flour

GLENN DAVIDSON and JAMES H. CAGLE

▸▸▸ THE CONSUMPTION OF technical soya flour by the wall paper and paper coating industries during the last few years has amounted to several million pounds annually. Despite this relatively large consumption, so far as is known, no methods of evaluating this product have been published.

An impression is widely prevalent that all technical soya flour is about the same. Certain simple tests, however, can be made to show that this impression is highly erroneous.

These tests have evolved from a quarter of a century of experience in the testing of technical soya flour at a testing station adjacent to the packaging department of a soya flour mill. They have been designed specifically to be carried out by workmen who possess no particular training and are sufficiently brief to permit their repetition several times on each shift.

One of the critical characteristics of soya flour is the heat sensitivity. The protein of such flour may be more or less denatured by heating, i.e., reduced in solubility or coagulated, much as egg white is coagulated upon boiling. Obviously, the least amount of denaturation allowed to take place, the better adhesive for paper coating and wall paper purposes. To illustrate: Many of our mothers used raw egg whites in lieu of household mucilage, but whoever heard of using a boiled egg as an adhesive.

For many years, the so-called pat test has been used as a measure of this denaturation. One application of this test was described in U. S. Patent No. 1,903,172 issued to the senior author and others (application for this patent was filed on June 14, 1926).

PAT TEST

Equipment

(1) A coffee cup, preferably of the very heavy walled variety or its equivalent

(2) A piece of ⅜ in. hardwood dowl about 7 in. long

(3) Scales for weighing out sample

(4) 25 cc. graduated cylinder

Procedure

Measure 20 cc. water into coffee cup. Add 20 g. technical soya flour to water in cup and stir, using the dowel as a stirring rod.

Interpretation

If the flour and water form a sticky paste which adheres uniformly around the inner wall of the cup, consider the sample as satisfactory.

If the paste, as it is being stirred, shows signs of breaking away from the wall of the cup but for the most part adheres to the wall, pass the sample tentatively as satisfactory. This condition, however, indicates slight overheating.

In the case of a soya flour manufacturer, an immediate search for the source of the overheating should be instituted. This search should not be abandoned until the trouble is corrected. Tests should show the paste to be sticking uniformly all around the inner wall of the cup before considering it as entirely satisfactory.

In the case of user, the entire lot should be closely scrutinized to be sure that there is nothing in it more highly denatured than the sample

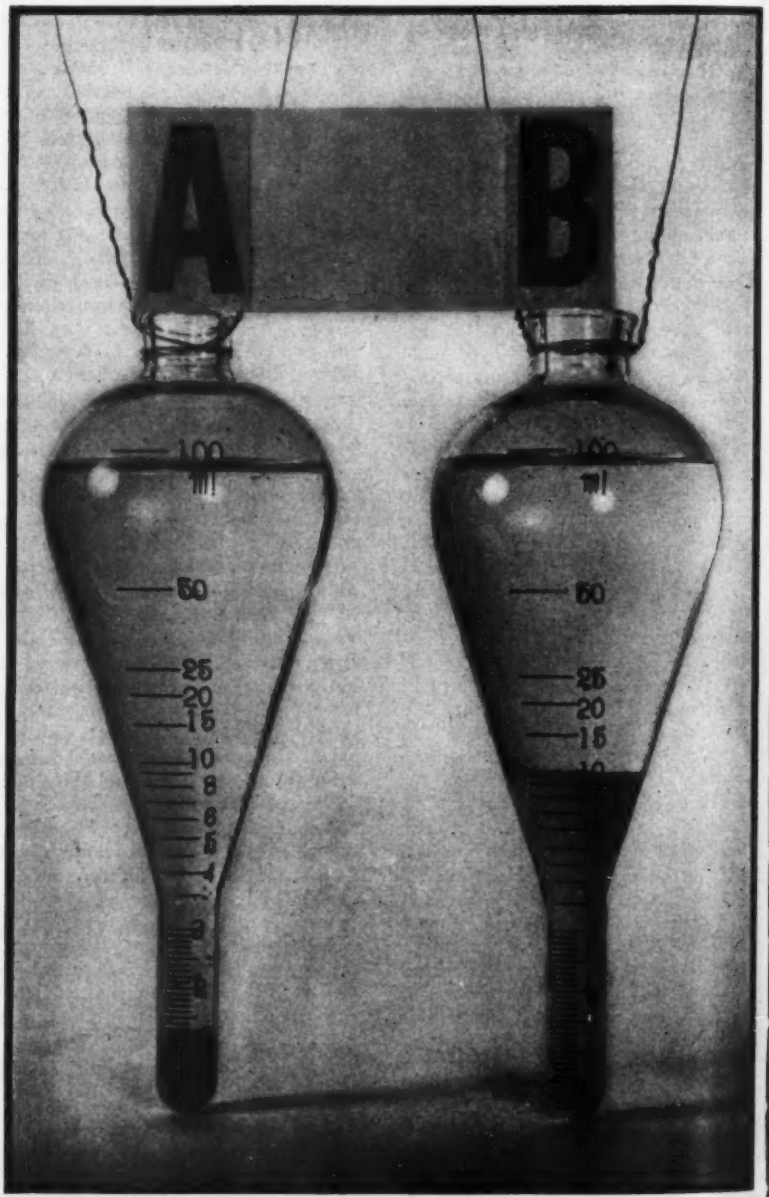


Fig. 1—Here is shown the range in the amounts of oversize hemicellulosic sludge in technical soya flours currently being offered to the wallpaper and paper coating field

AUTHOR'S NOTE: In 1922, at the Olympia Veneer Company, Olympia, Washington, the senior author, working as Chief Research Chemist for I. F. Laucks, Inc. (now a division of Monsanto Chemical Company), personally prepared many dozens of batches of soya bean flour glue, which were used commercially in manufacturing plywood. Extended patent litigation later showed that this was the first use ever made, anywhere in the world, of soya bean flour as a commercial adhesive.

• During the years immediately following 1922, the use of soya flour as a glue attained major proportions in the plywood industry. Until 1927 all soya flour so used was ground from soya bean meal produced in China.

• In 1927, the senior author working with I. C. Bradley (now manager of Allied Mills, Inc., Taylorville, Illinois) at Funk Bros. Seed Company, Bloomington, Illinois, processed the first soya beans in the United States to be used for adhesive purposes. Between 1927 and 1936 all soya beans processed in the United States for adhesive purposes were processed under Mr. Davidson's immediate supervision. During this period, he was eastern manager for I. F. Lauck's, Inc. In this capacity, he supervised the construction of that company's present soya bean processing plant at Portsmouth, Virginia, and the early years of its operation.

• A great many U. S. patents have been issued pertaining to the adhesive use of soya bean flour. Although no actual count has been made, probably more than half of these patents bear the name of the senior author as inventor or co-inventor.

• The authors wish to thank Milton Dippold, chief chemist, Spencer & Sons, Inc., Decatur, Illinois, for certain valuable suggestions regarding the wet sludge test.

tested. In other words, a test of this kind does not permit rejection. It is a warning that should put everyone on guard to see that nothing worse is made, or used, as the case may be.

If the paste fails to stick to the wall of the cup and rolls into a dough-ball, the sample should be rejected unconditionally.

Over the years, result of pat tests have come to be expressed as being "green" or "dry." The reasons for these designations are: A test which adheres to the wall of a cup usually possesses an odor resembling fresh, green soya beans and is sticky to the touch. A test which rolls into a ball instead of sticking to the wall of the cup, feels dry to the touch.

The more dry the pat test, the more viscous will be the size made from the corresponding flour.

Where a more precise method of evaluating the amount of denaturation is desired, the viscosity of alkaline dispersions (i.e., the finished size) can be determined with a Macmichael viscosimeter. This method of control has been used jointly with the pat test in the manufacture of technical soya flour for twenty-five years.

If a wall paper color or a paper coating color contains particles larger than the openings in a U. S. Standard No. 200 sieve, the majority of such particles will fail to pass through the nip of a roller running against a sheet of paper, e.g., a wall paper printing roller or a color applicator roller. In other words, such particles will accumulate in the color box, thus causing the color to become muddy or sandy and unusable. Once an excessive amount of these particles has accumulated in a color box, the box must be washed out and a new start made with fresh color.

In addition, these larger particles contribute much more to brush marks with a brush type coater than do particles which will pass through a U. S. Standard No. 200 sieve.

It goes without saying, that all soya flour manufacturers separate, to the best of their ability, all weed seed, bean hulls, and other sources of crude cellulose from the stock from which technical soya flour is to be made. However, the hemicellulosic cell wall material within the cotyledon of the bean cannot be satisfactorily separated.

It thus becomes imperative to grind the flour to such a fineness that the resultant product contains only an absolute minimum number of hemicellulosic cell wall particles which are capable of swelling in aqueous alkali to a size larger than the openings of a U. S. Standard No. 200 sieve. The production of soya flour of this fineness, without allowing the heat of grinding to excessively denature the protein, as shown by the pat test, presents a major problem.

The wet sludge test has been evolved to better control the fineness of grinding. This test is more satisfactory than a dry sieve test, e.g., determining the percentage of dry flour passing through a 325-mesh sieve. It is a direct measure of the trouble-causing material.

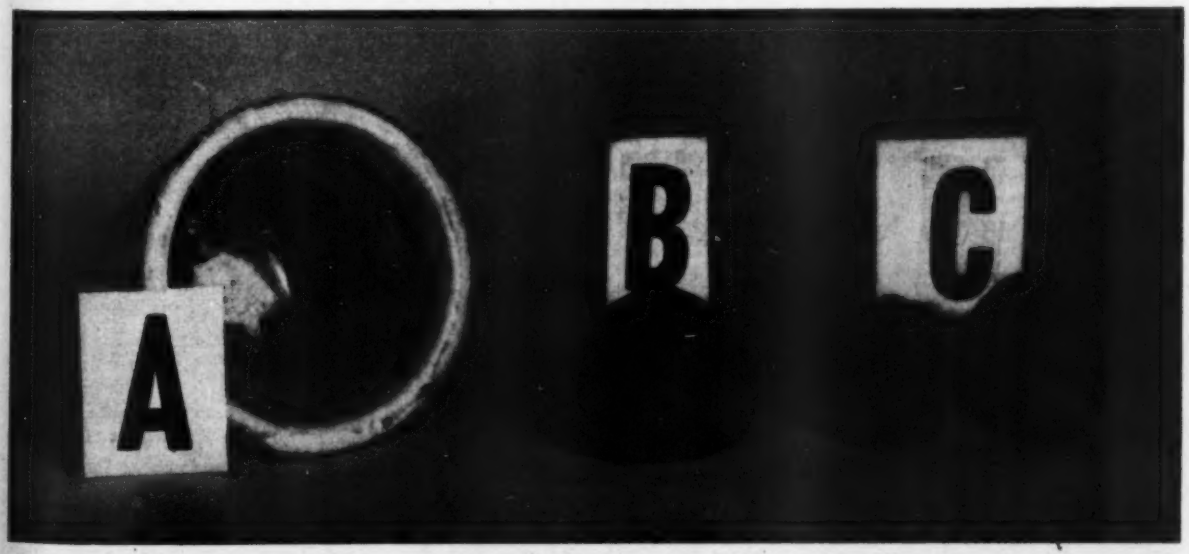


Fig. 2—(A) Satisfactory pat test where the paste adheres around the inner wall of coffee cup. (B) Unsatisfactory pat test where the paste would not stick to the inner wall of the cup but rolled into a dough-ball instead. (C) Same as (B) showing dough-ball broken in two. Flour used in tests (B) and (C) was ground from commercial soya bean hog feed meal

WET SLUDGE TEST

Equipment

(1) A No. 200 U. S. Standard sieve
(2) A 100 cc. graduated cylinder
(3) A centrifuge of the petroleum type, either hand or power driven
(4) Centrifuge tubes, preferably pear-shaped type
(5) A 250 cc. beaker and rubber tipped stirring rod

Procedure

Measure out 100 cc. water in graduated cylinder; transfer 40 cc. of it to beaker and add 20 g. flour to be tested. Stir until smooth. Add remaining 60 cc. water in small proportions stirring smooth between each addition. Add 10 cc. 20 per cent caustic soda solution (20 g. NaOH/-100 cc. water) and stir for one minute. Dilute with approximately 100 cc. water. Sieve through No. 200 U. S. Standard sieve. Wash oversize remaining on sieve freely with running water. Break foam with octyl alcohol, and by rubbing sparingly and very lightly with fingertips. If aggregates of undiluted alkaline paste appear, disintegrate by rubbing very lightly with fingertips against sieve cloth. Wash material on fingertips onto sieve. Wash sludge together as much as possible and drain. Then wash sludge into clean beaker and pour suspension into centrifuge tube. Centrifuge for one minute at full speed. Exact time is not critical.

Interpretation

The volume of the centrifuged sludge in the tube should not read more than just slightly over 1.0 cc. at most, preferably less.

The crudity of the tests which have been described may cause some precision-minded technicians to shudder. Yet, they are direct measures of the only two components in technical soya flour (i.e., protein denaturation and volume of oversize hemicellulose particles) influenced by the manufacturing procedure. All remaining components are determined by nature. It is assumed, of course, that commercially good oil removal, dehulling, etc., has been accomplished.

Research has established that nature holds her components of the character of technical soya flour, constant and uniform, as judged by practical standards, over a very wide variety of climatic and soil conditions and differing bean varieties.

Stated in another way, three lots of technical soya flour, for example, one made in Illinois, another in Virginia, and another in China, will give exactly the same practical results in a paper coating or wall paper mill, if each of them meets the previously described specifications. In other words, if a technical soya flour meets the foregoing specifications, there is no way for the manufacturer to further improve it except by modifying some of its nature-given characteristics. That is something for the future.

To date, the nature-given characteristics of technical soya flour have resisted attempts at beneficial modification. All work has indicated that the more nearly virgin the protein in the finished product, the better the flour.

If a flour meets the pat test specification, the protein in it is as nearly virgin, i.e., undenatured, as obtainable thus far.

If all technical soya flour conformed to the specifications which have been outlined, paper coaters and wall paper printers alike would feel less inclined to replace it with other adhesives when they become more plentiful.

After all, technical soya flour, like any other manufactured product, is only as good as the specifications to which it is made, no better, no worse.

The WHY and HOW of an Employee Recognition Program

ROLAND W. RICHARDSON
Personnel Director
The Gardner-Richardson Co.

▶▶▶ "WHY DOESN'T OUR company provide length of employment pins or some kind of an emblem so that we may be recognized as Gardner-Richardson employees? . . . Then we will have something to back us up when we tell our friends how long we have worked for the company."

This question and comment were made during a company social affair one evening in 1940 by one of our skilled men who since has been promoted to be a foreman. It was the beginning of a movement which has become a very important and worthwhile part of our company's Industrial Relations Program.

It wasn't hard to get the approval of top management after it was discovered that not only one, but many of our employees at both the Middletown and Lockland plants, had the same idea. So the personnel department got the green light to go ahead and work out the details of a length-of-employment recognition plan.

First—After talking with a number of our employees, including executives, supervisors, department heads, and men and girls in the plants and offices, it was decided that a length of employment pin or service pin, so called, would be the most satisfactory type of emblem.

Second—Our first problem was to design an emblem that would represent both the company's paperboard mills and folding paper carton plants. We invited several of the well-known emblem manufacturers to submit designs but none were completely satisfactory.

About that time our company

adopted a trade-mark which solved the problem; it was then merely a matter of designing a pin around this trade-mark. It was decided to set up the plan in five-year steps with a different colored pin for each five-year period of employment.

Our art department got busy and designed an oval-shaped pin around our trade-mark, the caliper and flask, on a white background with different colored borders for the different five-year steps. The name, Gardner-Richardson Company, and the number of years—5 to 50—are lettered in the colored border, and it makes a very neat, simple, and attractive design.

The first, or 5-year pin, is made of bronze metal with a natural bronze border and burnished bronze lettering.

The 10-year pin is made of silver with a silver border and polished silver lettering.

The 15-year pin is gold filled, with a light blue enameled border and gold lettering.

The 20-year to 50-year pins are: solid gold with gold lettering on a black border for 20 years; red border for 25 years; green border for 30 years, and a dark blue border for 35 years and up.

The 50-year pins are further enhanced by the addition of two small cut diamonds. There are two such pins now being worn by 50-year men.

The final pin design having been approved, it was necessary to determine the exact employment date of all our 1,700 or more employees. Our personnel records could give us this information for the past ten years or so but they were not accurate enough to be depended upon prior to that time, especially since in the middle 1920's a disgruntled employment clerk had thrown some of our employment records into the beaters just before he quit.

A questionnaire was distributed to all employees (starting with the president) requesting their last date of employment by the company. This information was checked with our existing records and a date established for all.

It was decided that December 31 of each year would be the deadline for determining which year pin each employee would receive. That is, if an employee's employment date indicated he had been continuously employed by the company since, say December 1, 1920, he would be eligible to receive a 20-year pin at the presentation ceremonies which would be held the early part of the year 1941. If his employment date had occurred January 15, 1921, he would have to wait another year to receive his 20-year pin.

Occasionally, our company records and the employee's questionnaire answer regarding the last date of employment did not agree. These cases were investigated and if it could not be proved that the company's records were correct, the employee's questionnaire date was accepted. This happened with some of our older men in the twenty- to forty-year groups.

No credit was given for previous employment where an employee left the company and later was re-employed; this did not apply for lay-offs, where the employee returned when he was called. Such cases, however, were few and far between.

After the number of pins needed in each five-year group was determined and ordered a date was set for a general meeting of all company employees in the early part of February, 1941. Inasmuch as our plants were running six days a week, twenty-four hours a day, it was necessary to select a Sunday night. One Sunday for employees of the Middletown plants and office; another for the Lockland plants and office.

Each employee received an invitation for himself or herself and one guest (usually wife or husband) to attend the company dinner meeting on the selected Sunday evening, to be held in the ballroom of one of the hotels in the city.

At the speakers' table there were a number of company officials, including our president, vice president of operations, and vice president of sales. There was no other planned seating arrangement. Other company officers not on the program sat down with the men and girls who work in the plants. These were company officers, sales managers, plant superintendents, department heads, and foreman mixed in among the more numerous factory workers. The common denominator of the meeting being years of association with the company.

After dinner each vice president gave a short talk on the company's affairs, its problems and plans for the future with regard to his own particular department. Our president then spoke of the importance of employee loyalty to the company and the mutual benefits derived from such a relationship, and how much each man and girl in their jobs contributed to the success of our company and helped maintain continuous uninterrupted employment and a steady income for all.

Then the personnel director announced the length of employment pin program and explained how it worked.

Starting with those oldest in employment with the company he read the names of those in each five-year group, asking them to come up to the head table where each received congratulations from the president and award of pin for which he was eligible.

It made quite an impressive ceremony as the 45-year men came up in a group, the 40-year men, the 35-year, and so on down the list until the 5-year men and girls, newest group of employees to be recognized, finally received their pins.

After the meeting adjourned, there was music and dancing for the younger employees and the older men and women sat around their tables and reminisced of the old times in the mills —and a good time was had by all.

Of course, we missed presenting some of the pins due to sickness or other unavoidable causes that kept some employees from attending the dinner meeting. However, these pins were presented by the superintendent or department head the following week.

Some of the employment dates were wrong, too, notwithstanding the care used to have them accurate. These were straightened out, however, and everybody was finally satisfied.

Each year, since the program started, our company has had a similar annual dinner-meeting for all employees at each plant location and those eligible are presented with their next five-year pin.

Since the program started, at subsequent annual meetings those employees eligible for new pins in the next higher five-year group are requested to turn in their old pins. These are sent back to the original manufacturer who repairs them, if necessary, cleans, polishes, and returns them ready to be used over again.

When an employee leaves the company for any reason he takes his last pin with him. It's his for keeps.

The results of this program are well worth-while. There is no doubt that these men and girl employees are impressed when they receive a pin, congratulations, and a hand shake from an officer of our company.

We further believe that turnover among our employees is lessened and that they get a better understanding of the company's affairs and problems as a result of these annual pin presentation meetings.

The feeling of loyalty to the company and genuine interest in its affairs resulting at least in part from this program are further evidenced by the fact that the average length of employment among our more than 1,700 employees is about 12.5 years; this since the end of the war covering the period of greatest industrial turnover. We believe the length of employment recognition program as conducted by this company is well worth the expense and the work required to administer it from year to year.

NEPCO Forest Management Program

R. C. DOSER, Forester
Nekoosa-Edwards Paper Co.

▶▶▶ A REFORESTATION and forest management plan has been conceived by Nekoosa-Edwards Paper Company and is being conducted for the purpose of eventually supplying from its own forests the pulpwood requirements of its mills. This program is evidence, at least in part, of the progress both of forestry and philosophy that promises some day to establish a new economic balance throughout that area of Wisconsin that never can be more than forest land. Time has brought the realization that forests need not be destroyed by use, but that planned cutting and forest management can be made to produce continuous crops from permanent forests.

Above—A typical fire tower

Below—Fire fighting truck

Wisconsin today is witnessing a phase of progress and development that is returning thousands of acres of land to forest use. The forests growing in Wisconsin, including the Nepco forests, will be assets rather than liabilities to the state and to the people. They will provide the basic raw materials for the wood-using industries of the state. They will provide tax income and employment for woods workers and converters. At the same time, the forests will exert their basic value in conserving the land and the water table that underlies the land.

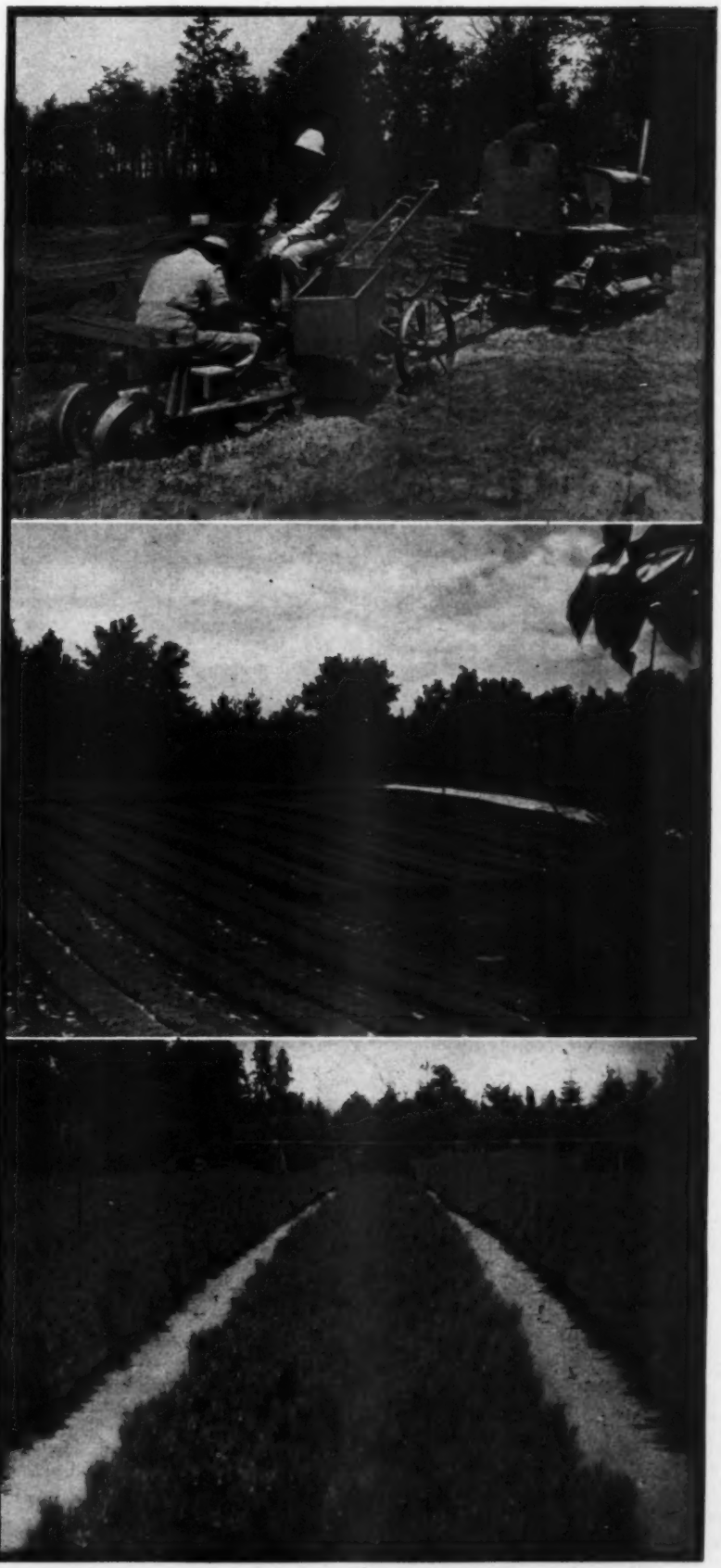
Since 1926, when the Nekoosa-Edwards Paper Company put its forestry program into effect, the company has

been acquiring timber properties and planting trees for pulpwood forest development on a sustained yield basis that will enable these forest acquisitions, when complete, to take care of a large portion of its future pulpwood requirements. This program of forest land purchase and reforestation now totals about 110,000 acres of forest, including plantations as well as natural forest growth.

Nepco's holdings are located in two areas of Wisconsin. One is on the sand plain of central Wisconsin within truck-haul of the mills, and the other is in the north central area of the state in Oneida County. The latter area was purchased in 1943. Each area contains close to 55,000 acres and is composed principally of pine stands in the central area, and spruce, balsam, pine, and hardwood stands in the northern area. The Nepco plan includes both the purchase of barren land and planting trees, and the purchase of lands containing natural forest growth and supplementing that growth where necessary by planting.

Each piece of property considered for purchase by Nekoosa-Edwards is first inventoried and analyzed as to how and where it fits into the long-term investment plant. After the property has been purchased, company foresters determine what portion of the area requires supplementary planting. The planting schedule is worked out and the nonproductive portions are planted to jack pine, Norway or white pine, depending upon soil conditions. All phases of forestry practice are carefully studied, checked, and analyzed as related to the purchased lands, and the results of this continuous study are reflected in the evolution and application of the present plans. Experience has established facts regarding the type of stock preferred for forest planting and the planting methods that yield best results.

Some years ago, the Nekoosa-Edwards Paper Company revolutionized planting methods by the introduction of a mechanized tree planter. This consists of a power unit, breaker plow with planting shoe attached, and a trailer following along the furrow with two large wheels to pack the trees firmly into the ground. Three men can plant 15,000 trees per day using this machine and do a better job than the old method of hand planting.



Above—Mechanized tree planter

Center and Below—Two views of nursery beds

To date no survival count has fallen below 90 per cent and most have been considerably higher.

The original plan (in 1926) called for plowed furrows six and seven feet apart and planted trees six feet apart in the furrows. Experience has proved the best method is to plow furrows no more than five feet apart in the brushy areas and space the trees five feet apart. In clearings and old fields, the trees are set in four-foot rows four feet apart. A quick closing of the tree crowns results in earlier shading of the ground, helps to retain the moisture in the forest floor, and produces a better growing condition in the early life of the trees. Following the plan of 4 x 4 spacing, with 2,700 trees to the acre, losses up to 50 per cent could be sustained and still leave sufficient trees so that no replanting is necessary. Planting stock is obtained from the company's forest tree nursery, which today inventories close to 4,000,000 trees.

The planting stock consists of jack pine, Norway pine, white and black spruce, and balsam fir. Many other types of seedlings are grown for the open market. Some ornamental stock is grown for sale to help defray the costs of growing stock for forest replanting. Large nurseries are the best customers for the smaller ornamental trees. They are purchased and held over in these large nurseries until they have reached landscaping size and then resold to individuals. Larger ornamental trees are sold to individuals in the area for landscaping purposes, and ornamental stock is shipped to twenty states.

Seeds are obtained either on the open market or procured by Nekoosa agents. When it is necessary for the Nekoosa Woodlands Department to get its own seeds, they are purchased in the seed cones by the bushel. The cones are soaked in water for a short time and then placed on trays in a heated oven-type chamber. The cones dry out and open, leaving the seeds exposed. These cones are then placed in a wire cage-type cylinder and rotated. The cones tumble over one another and are shaken up so that the seeds are loosened and drop out. These seeds are cleaned and sorted on a fanning mill and then planted.

The seeds are planted in prepared beds by hand, generally in the fall, and are allowed to remain in these beds for two full growing seasons. Following this, some of the stock may be sold as 2-0 stock, and the remainder is planted either by hand or with a transplanting machine in rows about one foot apart and the trees placed two inches apart. After two years, these trees are taken from the transplant beds and either planted in the forests owned by Nekoosa-Edwards Paper Company or sold to individuals or nurseries.

One of the major components of forest management is the Fire Protection Plan. The greatest enemy of forests is fire, and Nekoosa-Edwards maintains adequate fire protection for its forest properties. First, there are facilities for the detection of fires. This is accomplished by a co-operative agreement with the Wisconsin Conservation Department, as a result of which eight state and Nepco fire towers cover the areas completely. These towers report a smoke to the state district headquarters immediately, who in turn notify the company's headquarters if the fire is on or within one mile of its forest holdings.

Each tower is manned by an experienced, well-trained individual who is stationed in the tower every day during the fire season. The season lasts from the first dry spell following disappearance of snow in the spring to the return of snow in late autumn. The tower ranges in height from 60 to 100 feet and usually is located on a place higher than the surrounding territory to further extend the field of vision from the tower. A map table is located in the center of the tower cabin. This map shows all of the surrounding territory with roads, streams, and high areas or ridges included. A sighting instrument called an "alidade" is placed across the top of the map and is centered on the middle, which is also the location of the tower on the map.

When a tower man spots a smoke he immediately sights it in his alidade. He then calls headquarters and gives the following information: degrees or azimuth reading as taken from his map; estimated distance from tower to fire; and volume of smoke. Other towers strategically located throughout the area duplicate the procedure and the fire can then be located exactly on the headquarters map by extending and crossing strings representing the tower man's line of sight. The fire is located exactly by intersection of these strings.

The next step is to provide efficient means of fire suppression. To accomplish this Nekoosa has constructed nearly 130 miles of fire lane roads throughout its 110,000 acres of forest. In the Central holdings, the roads are so laid out that each 160-acre tract, one-half mile square, is bounded either by a town, a county or a state highway, or by a company fire lane road. The roads serve as firebreaks to stop slow running ground fires, give easy access to all parts of the forest, and permit fire truck pumpers to get within a quarter-mile of any fire that might break out. This truck carries equipment for a forty-man crew. Seldom is it necessary to run more than 1,500 feet of hose to a fire.

In the center of Nekoosa's central Wisconsin holdings is a fire fighting substation. This consists of a dwelling, plus enough modern fire fighting equipment for a crew of six men. One man and his family reside here the year round working at fire detection and suppression during the summer and general forestry jobs during the winter. This substation has telephone connections with the state ranger headquarters in the area and receives the same fire information and directives as the other state substations, and the Nekoosa-Edwards headquarters.

Oneida County holdings have a topography much different from the plain-like area to the south. Hilly morraines and low swamps necessitate the fire lanes to follow the ridges and high areas throughout the area.

In both areas are stationed ¾-ton pickup trucks with water tanks and gear mounted pumps attached to the truck motor. Auxiliary equipment on the trucks includes pack-can sprayers and shovels and general equipment for ten men.

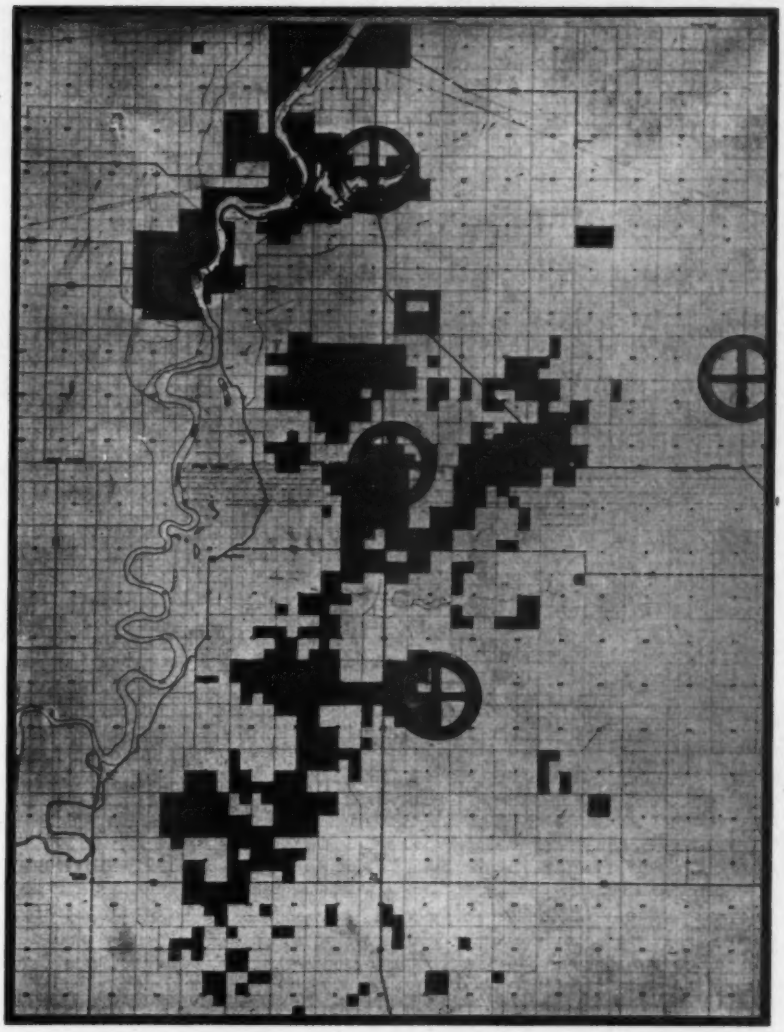
When the state headquarters in either region notifies Nepco of a fire, all other business is dropped and the crew with truck and equipment races to the fire—down main trunk highway, town road, and fire lane to the exact location, and no fire is more than fifteen minutes away from headquarters.

If possible, the fire is subdued directly with water from a 600 gal. tank truck. Further, a trench is put around the entire fire area using a tractor and double mouldboard plow, thus preventing the embers from starting anew and escaping the restricted fire area. The main body of the crew then covers the entire fire area with pack-cans full of water, and shovels covering glowing roots with dirt and soaking smoldering "hot spots" with water. When under control and out to all appearances, the main body of the crew disperses, leaving a two-man crew to patrol the fire area insuring the complete suppression of the fire.

Nekoosa-Edwards fire losses have been so small as to be practically negligible. The records show that from 1926 to 1946 a total of 48 fires occurred on company properties which burned over a total of 32 acres of new planting and 73 acres of natural forest, as well as 32 acres of scrub oak

and marsh. This amounts to a total of 137 acres burned over during a 20-year period, an average of little more than 6½ acres per year or approximately 2.8 acres per fire. The total loss during this period was less than $700 or a fire loss amounting to approximately $35 per year.

The areas that support a partially mature forest are cut on a sustained yield basis. With the exception of the planted areas, the natural forest growth is made up of uneven-aged stands. Trained foresters analyze these stands, ascertaining the amount and size of pulpwood that may be cut and transported to the mill. These



Fire map; shaded areas are property Nekoosa-Edwards Paper Co.

trees are then marked so that only those so designated will be cut. Many factors govern the selection of such trees for cutting, such as density of the stand, diameter of trees of the entire stand as related to those selected for cut, crown density or canopy formed by the interlacing of the tops of the trees, and many others. It is often necessary to mark for cutting those trees that are smaller than the average diameter of the stand but are still of commercial size or value.

The actual cutting is done by local farmers or residents of the areas in or adjacent to Nekoosa-Edwards holdings. They purchase the timber outright on a stumpage basis, generally on one, but sometimes on two or three descriptions. The stumpage contract gives these individuals the right to cut the designated trees in a stipulated time period and deliver the pulpwood to the mills directly by truck or to a railroad car on siding for subsequent transport to the mills. At the present time, there are about twenty "regulars" who with their trucks and small crews cut during the off season from farming or who cut steadily the year round. These crews have been trained to follow good forestry practices in their work from a low stump height, proper felling so as not to injure adjacent trees, to safe and proper disposal of the slash.

The advantages gained from this program are obvious. Nekoosa-Edwards is assuring itself of a permanent source of pulpwood supply from its own permanent forests, realizing all economies present in producing its own raw material instead of purchasing from others. Transportation costs are reduced by the convenient location of the forests, and for all time to come the company will have control of its own pulpwood supply, both as to quantity and quality.

There are other advantages, perhaps not so apparent, which cannot be ignored in evaluating the importance of this program. These advantages, to the state and general public, include the fact that forest lands are made productive and are contributing income to the state from forest lands in private ownership. In helping to maintain the state's forest industry, Nekoosa is providing increased employment in that industry. The state and the people also derive the basic conservation advantages of substantially increased forest cover in flood prevention, soil conservation, and the preservation of the subsurface water supply. There is, too, the matter in increased and improved cover for wildlife which involves not only recreational opportunities but helps, in some measure, to support the Wisconsin's vacation industry that depends upon the preservation of forest cover, wild life, and scenic beauty of forest lands.

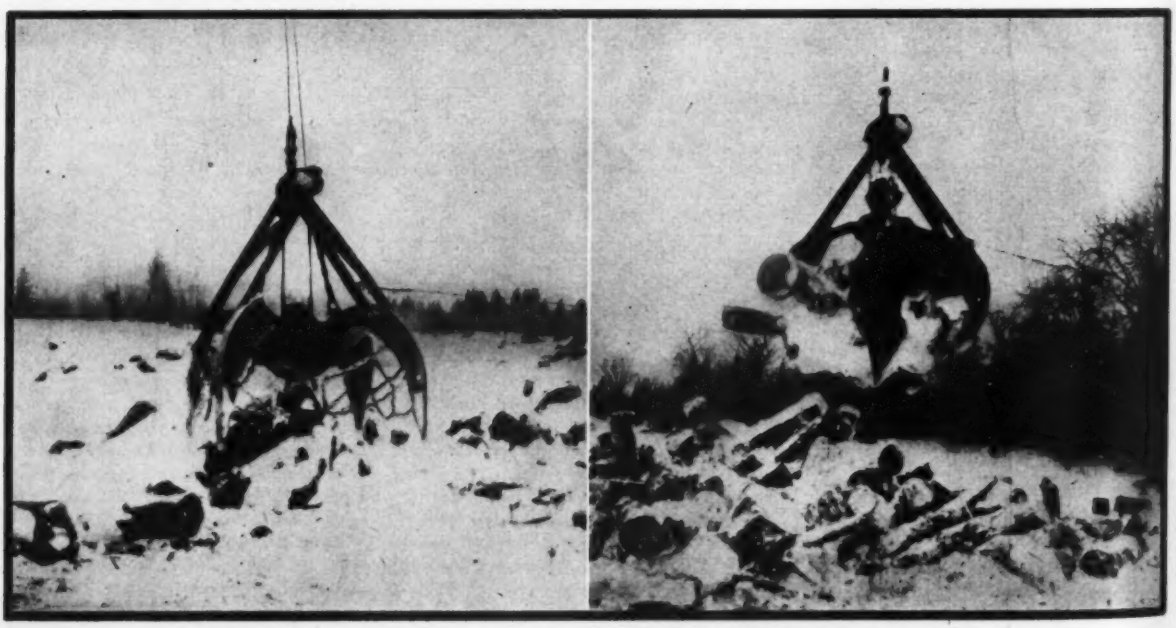
Beyond all this, the Nekoosa-Edwards Paper Company is helping to point the way toward the regeneration and the perpetuation of forest lands in private ownership by proving that the rehabilitation of dismantled forests need not be conducted at the expense of the public. To whatever extent the profit opportunity in private forest management can be demonstrated, it will stimulate the interests of other companies and individuals in forest ownership, and Nekoosa will have helped to establish a new economy and a new prosperity for those areas of Wisconsin that are primarily dependent upon their forest resources.

Grapple-Equipped Crane Transfers Pulpwood from River Bank Into Stream

Operation: casting 4 ft. 2 in. pulpwood blocks into middle of stream from bank

▶▶▶ A NEW METHOD of getting pulpwood from a river bank or the shore of a lake or pond into the water for water transportation on the way to mill is incorporated in the use of a boom-equipped crawler crane and grapple combination. Such a crane is mobile and, through the use of the grapple, can pick up the pulpwood piled along the shore and throw it into the water. A 25-foot boom makes it possible to throw the wood 30 or more feet from the point of pickup. Through such practice, the wood definitely can be placed in the water with little or no possibility of lodging on the bank in the transfer operation.

The accompanying illustrations show one of the winter pulpwood handling operations of the Finch-Pruyn Company, Glens Falls, New York. In this instance, the operation being located near Newcomb, New York, the pulpwood was moved from a stream bank and piled on the ice of the stream down which it was to travel with the break-up in the spring. Equipment used to do the job consisted of a light crawler crane with a 25-foot boom equipped with a small-tined grapple (Link Belt Speeder Crane LS-40 and Owen Bucket Co. grapple).



Grapple lowered (left), and raised with load (right)

Paper Mills Should Make More Money

JOHN D. CORRIGAN
Corrigan, Osburne & Wells, Inc.

▸▸▸ THE PAPER INDUSTRY has discovered that it is more difficult today than possibly ever before for management to show profits commensurate with the financial risk. What has brought about this situation? An analysis of the profit making ability of the industry will reveal what has happened.

Conditions during the war years for industry in general were comparatively simple. Manufacturers did not have to worry about sales or profits. Profits were practically guaranteed. Credits were nearly perfect. More rapid turnover of manufactured goods and prompt payment for them practically eliminated the need for operating capital. Many manufacturers increased their dollar volume from 100 per cent to 200 per cent without any additional sales effort.

For several years past, paper and paperboard sales have been limited only by the ability of the industry to produce. Demand has exceeded production capacity—a most dangerous situation psychologically, particularly for those officials and executives who must decide for or against the increasing of

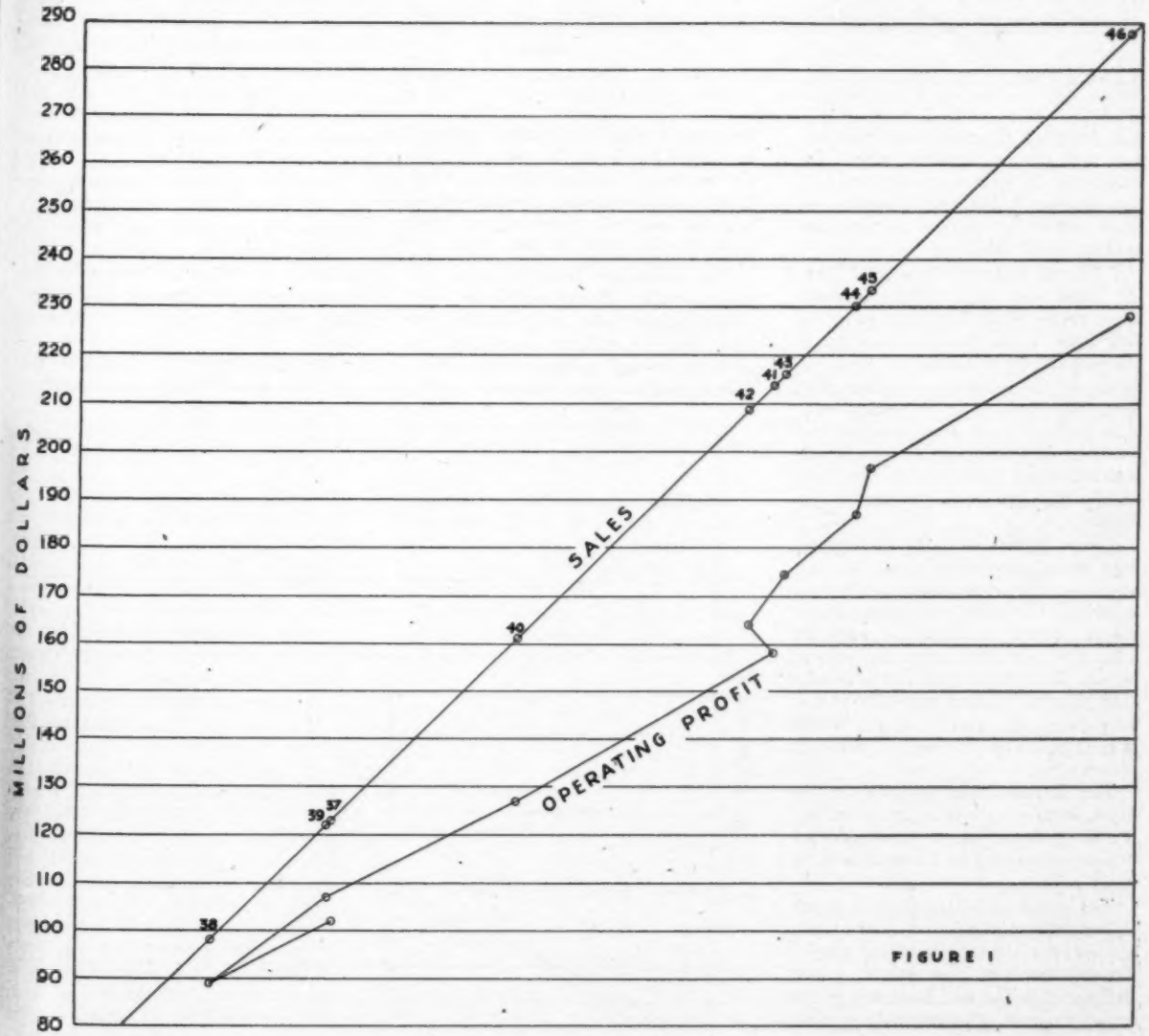


FIGURE 1

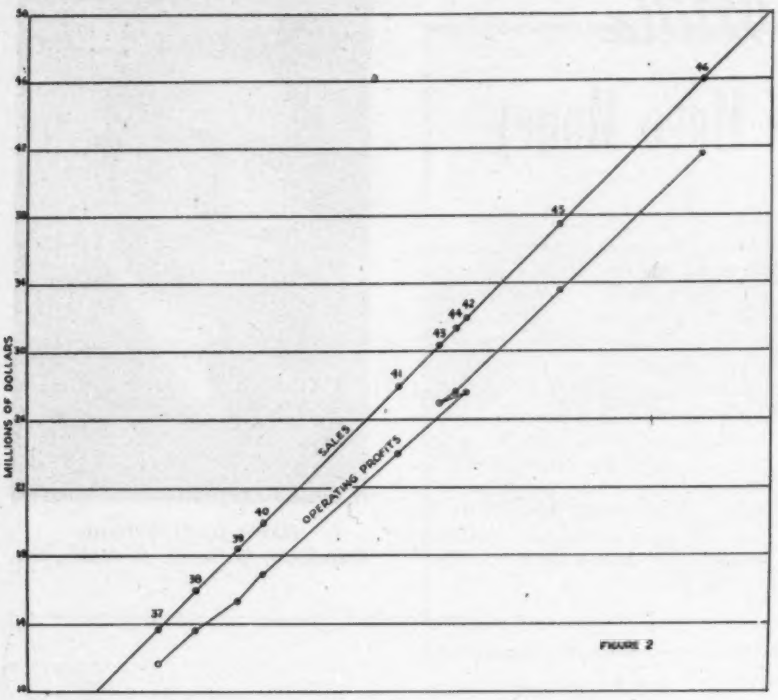


FIGURE 2

mill capacity through modernization, new mill construction, or both. The possibility of overexpansion and the development of excessive burdens in fixed charges are critical factors controlling these decisions.

Published financial reports of leading pulp and paper manufacturing firms reveal what has been going on and what is the present situation in the industry as a whole. A study of eleven of these reports indicates that operating costs have increased faster than technological improvements and that the industry is in a precarious position when considered in the light of the Government's forecasted recession.

Today, profits are being realized on high volume but these profits are not in proper relationship with production capacity. The break-even point of the average paper company has gone up over 100 per cent since the prewar period. In other words, if the break-even point of a paper company was at 40 per cent of capacity before World War II, it is now at about 80 per cent of capacity.

The technological position of the paper industry, therefore, must be improved if losses are *to be avoided in case of a recession in business activity or in prices.*

The profit activities of four of the eleven companies covered by the study are shown in the accompanying graphs. To make each of these graphs, a line, designated as the sales line, was drawn at an angle of 45 degrees on a piece of graph paper. This procedure was followed so that the figures expressed in dollars would be the same on both the horizontal and vertical scale. After drawing the sales line, the amount of sales for each year from 1937 to 1946 inclusive was located upon it.

The difference between costs and sales is profit. Therefore, a point vertically under sales was located for each year to indicate operating cost and the several points joined with a line to indicate what happened to operating profits as sales varied up and down over the ten year period.

Operating profit was used instead of net profit because it gives a closer comparison of production efficiency by eliminating profit taxes.

In the case of Figure 1, profits expanded with volume increases from 1938 to 1941. In 1942, the profit line moved toward the sales line, thus reducing volume profits in relation to capacity. Profits were still excellent for the company, but the break-even point jumped and kept creeping up. In 1945, the company sold 20 millions more of their products than in 1941, yet produced 18 millions less in operating profits. This reversal in trend is the result of a 100 per cent increase in the break-even point with only a 90 per cent increase in the sales dollar from 1937 to 1945 inclusive.

Adjustments were made in 1946. Tonnage increased eight per cent. Dollar income increased 23 per cent. Operating profits jumped 61 per cent. The break-even point fell to a point 70 per cent above the 1937 position.

During the past ten years, sales increased 134 per cent. Thus the break-even point increase of 70 per cent is not excessive.

Increased facilities, modernization of old plants, etc., are essential to growth. A company must make intelligent investments to improve its position. It should be done with the returns known in advance. Old equipment generally produces high cost paper.

The operating profit profile of the firm covered by Figure 2 nearly paral-

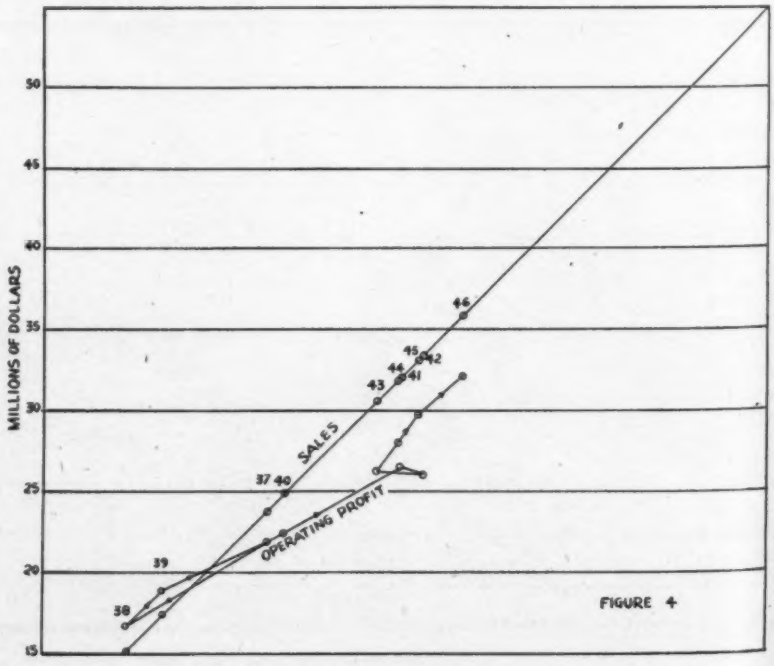


FIGURE 4

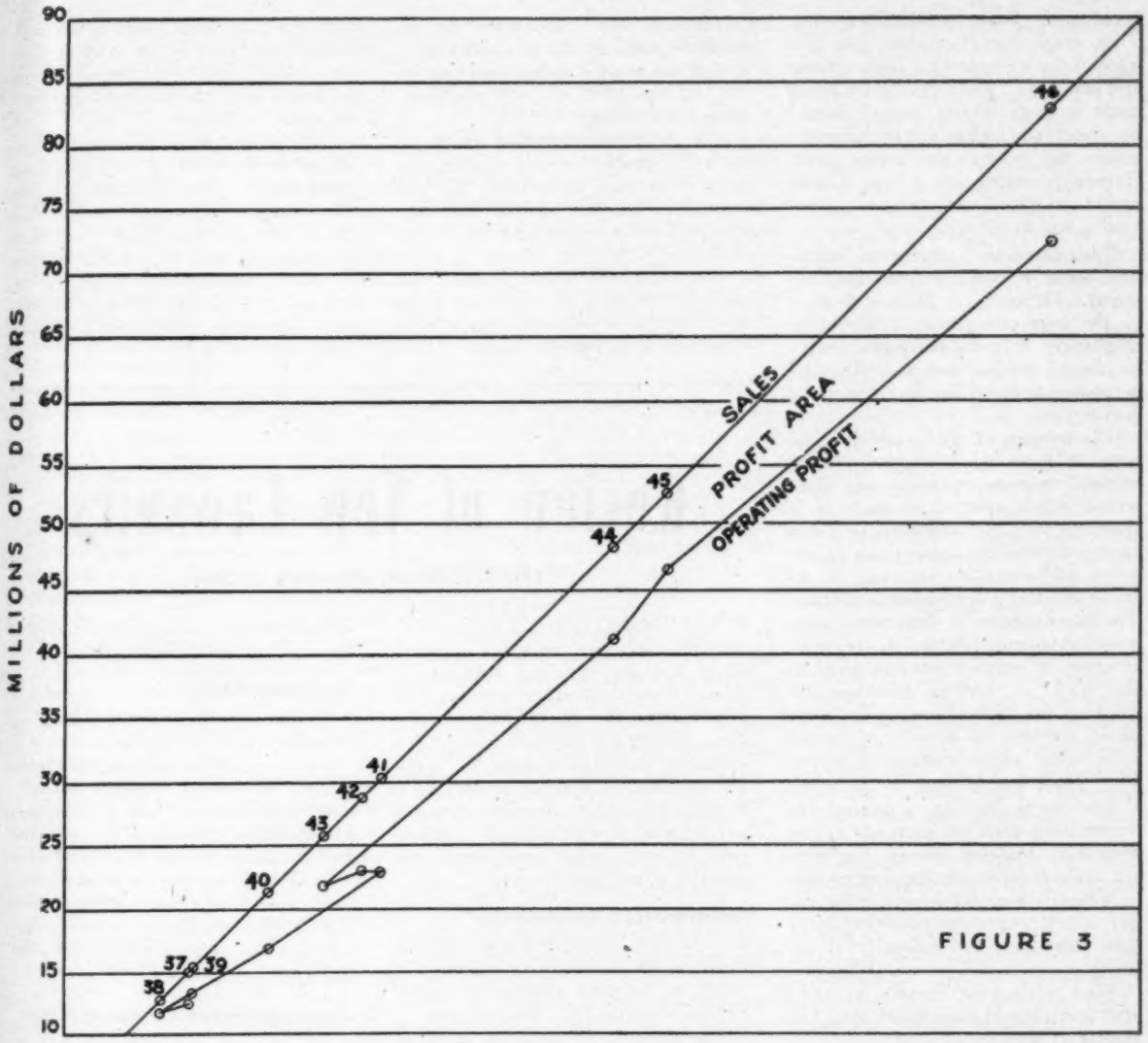


FIGURE 3

lels the sales line. A cutback in sales in 1943 cut into the profit area of the profile. Only in rare cases does operating cost drop back to its former point with a drop in sales volume. Sales in 1946 were 14 million more than in 1942, yet operating profits remained approximately the same. During the ten-year period, sales jumped 235 per cent; the break-even point, 320 per cent.

The year of greatest profit for the firm covered by Figure 3 was 1946. Sales jumped 30 million dollars that year over 1945. During 1942 and 1943, costs cut into the profit area. In spite of high sales, the former profit position was not regained. Sales for 1945 were 22.5 millions of dollars greater than in 1941; however, operating profits were 1.5 millions less. The large increase in sales during 1946 gave an increase of almost 100 per cent in operating profits over 1945. Comparing 1946 with 1941, sales volume went up 176 per cent and profit increased only 42 per cent. During the past ten years, sales increased by 455 per cent; the break-even point increased 600 per cent.

A firm without spectacular increases in sales is covered by Figure 4. An operating loss in 1938 and 1939 is shown by the operating profit line crossing the sales line. During the past ten years, sales increased 50 per cent; the break-even point went up 40 per cent.

The charts and comparisons have

Figure 5

Mill No.	Time Interval	Per Cent Increase in Sales	Per Cent Increase in Break-even Point
1	1937-1946	134	70
2	1937-1946	235	320
3	1937-1945	455	600
4	1937-1945	50	40
5	1937-1946	300	250
6	1937-1946 (April)	120	240
7	1937-1946	55	35
8	1937-1945	not published*	high
9	1937-1945	105	190
10	1937-1945	525	300
11	1937-1946	115	130

(*) Operating profits in 1945 were less by almost one-half of the 1941 profits. Operating profits in 1937 were 3.5 millions; in 1941, 5.1 millions; in 1945, 2.7 millions.

been made from published figures. They emphasize that there are two main reasons for profits: high volume and low costs. When profits are being made on high volume, money should be spent on technological improvements to reduce production cost, thereby preparing for a low volume period which, based on past experience, will come again.

Costs often are a matter of executive decisions based on tax requirements. Therefore, in fairness to each of the four cases cited, it should be emphasized that the individual analysis should not be used as a financial barometer to determine investment opportunities.

The purpose of this study has not been to show what companies have created reserves to meet any need which might arise as a result of a slump in the paper industry, to guard against diminishing profit yield, to improve technological situation, or to aid in building a strong fiscal position. The fiscal policies of these firms show sound economic policies in the preservation of assets when considered in the light of present governmental thinking and tax problems. The companies covered in these case studies have smart administration, otherwise they would not be leaders.

The charts illustrate a method for determining what has happened in any individual business during the past ten years or other selected time period.

Where is your break-even point today in relation to your mill capacity? Can this point be lowered? If so, how?

With a decrease in sales to 1941 sales level, would your mill show a loss instead of a profit?

The tabulation (Figure 5) reveals the per cent increase in sales and the per cent increase in break-even point over a specified time period for the eleven mills covered by this study. The financial statements from which this analysis was made were furnished either by the companies covered by the study or were taken from published reports of Standard & Poor's Industrial Directory.

Large increases in volume of sales commonly indicate expansion of facilities. Therefore, this reveals that the eleven mills, and there were many others, made substantial additional investments in their properties without increasing operating profits in proportion to the increased financial risks.

Most manufacturers believe that price increases will cure all financial problems. Price increases naturally result in increased profits, but they also lower consumer demand in a competitive market. And costs once increased never return to a previous level.

There is only one answer to the problem raised by the precarious position of the paper industry, and that is: efficient operation in both manufacturing and selling.

The paper mill executive concerned with this problem should establish his break-even point in relation to plant capacity. He also should determine the profit-making possibilities of his firm.

With this information at hand and with his thinking on a factual basis, any changes or improvements can be related back to a dollar value.

If the break-even point is too high, it can be reduced by lowering production costs through proper correlation of wages with the efficiency and productivity of labor.

The productivity of labor is catalyzed by the work of managers from the foremen to the president. If a fair day's work is to be expected for a fair day's pay, the supervisory staff must give consideration to problems relating to plant layout, work simplification, job evaluation, production standards, and incentives, and must act upon their findings.

Review of New Lawsuits

LEO T. PARKER, Attorney at Law

▶▶▶ DURING THE PAST FEW months, the higher court has rendered many unusual decisions relating to manufacturers and sellers of paper and paperboard. We shall briefly review these interesting and informative decisions in order that readers may protect themselves against similar suits. Readers who desire complete data on any decision may identify it by reference to the citation, and obtain the decision in any good library.

Contributory Negligence

It is well established law that an employee who sustains an injury as a result of his own negligence cannot recover damages from his employer.

For example, in Biersach v. Wolf River Paper Company, 20 N.W. (2d) 658, it was shown that a railroad station agent was struck by a truck on a narrow gauge track on Wolf River Paper Company's p r e m i s e s while checking railroad cars. He died as a result of the accident and his dependents sued the Wolf River Paper Company to recover damages for his alleged wrongful death.

During the trial, the truck operator testified that he did not see the deceased prior to the time he was struck. His testimony is that while taking the load of pulp from the pulp mill to the paper mill he felt a jolt as he passed the large pulp pile.

The higher court refused to hold the paper company liable, and said:

"If the jury believed the testimony of the truck operator that he felt a jolt while passing the pulp pile with the truck, they were justified in finding the deceased negligent as to the position assumed by him. . . . Negligence of the deceased was as much a cause in bringing about the collision as the conduct of the motorman."

No Invention

In Swain, 156 Fed. (2d) 246, an inventor filed an application for a patent comprising compositions containing substantial amounts of polyvinyl acetate acetal and a melamine-formaldehyde resin. Both the examiner and the Court of Customs and Patent Appeals held that merely because melamine resins are newer did not mean that it is patentable to try melamine-formaldehyde resins where the older resins are generally used.

Unemployment Compensation

According to a recent higher court, where a corporation which contracts with contractors to do work, and these contractors hire employees, the corporation is not obligated to such employees under such tax laws, as social security, workmen's compensation, or unemployment compensation.

For example, in Huiet v. Brunswick Pulp & Paper Company, 39 S.E. (2d) 545, it was shown that the right to cut and remove pulpwood was sold to certain contractors on a stumpage basis. The contractors then sold to the Brunswick Pulp & Paper Company the product or pulpwood sticks harvested on the lands. The work performed by employees was felling and limbing the trees utilized for pulpwood purposes, sawing them into blocks or sticks of a uniform length, piling or stacking wood, and loading it on railroad cars. These employees were paid wages by the contractors.

The employees sued the Brunswick Pulp & Paper Company to recover

compensation under the state unemployment compensation act. In holding the Brunswick Pulp & Paper Company not liable, the higher court said:

"It may be admitted that pulpwood is a commodity essential to the operation of the defendant's business, but it does not necessarily follow that the work of supplying the mill with pulpwood is a part of the usual business operated by the defendant (Brunswick Pulp & Paper Company) . . . If such workmen were employed by persons other than the defendant, who merely sold the harvested products to the defendant, they would be servants or employees of their employers and not of the defendant (Brunswick Pulp & Paper Company)."

Salesman Quits

In Brown-Brockmeyer Company v. Roach, 70 N.E. (2d) 481, it was shown that a salesman made a bona fide effort to find employment in his usual trade or work, or employment for which he was reasonably fitted, but found none and was offered none.

The court held that the fact the salesman had voluntarily quit work at his last employment did not deprive him of benefits under the state unemployment compensation law.

For comparison, see Kut v. Albers, 66 N.E. (2d) 643. Here the employee went to two different companies, each of which was willing to employ him as a shipping clerk, the nature of the employment being similar to that in which he was formerly engaged. He refused to accept the positions for the reason that he refused to work on Saturday.

The higher court refused to award him compensation under the State Unemployment Compensation Act.

Court Appoints Trustee

In State ex rel. Flodin v. District Court, Fifteenth Judicial Dist., Koochiching County, 25 N.W. (2d) 692, the litigation involved employees of the Minnesota & Ontario Paper Company, a Minnesota corporation. Lumber company employees instituted suit for termination of benefit fund to which employees had contributed and for payment of fund to contributing employees. The higher court refused to render a favorable verdict because the testimony proved that the lumber company, which was the trustee of a trust consisting of benefit funds to which company's employees contributed, was wound up and liquidated into the paper company. The court held that the money paid in by the employees, or the trust estate versed in the district court of the county in which the lumber company was located which had power to determine all the conflicting interests of the employees who contributed to the fund.

Date of Payment

In Central Paper Company, Inc., v. Commissioner of Internal Revenue, 158 Fed. (2d) 131, it was shown that the Central Paper Company was not liable on convertible trustee's certificates, but its property had been pledged to secure payment thereof. Also the corporation acquired for less than par value some certificates and exchanged them for its preferred shares, held by a trustee, at par for par, and canceled such shares.

In subsequent litigation the higher court held that the difference between the par value of such certificates and the amount paid therefor by the corporation was taxable income in the year in which the certificates were purchased, rather than in the year when they were exchanged for the preferred stock.

Closed Shop

According to a recent higher court a state law is valid which authorizes employers and employees to make contracts for "closed shops."

For instance, in International Brotherhood of Paper Makers, Local No. 66, A. F. of L., v. Wisconsin Employment Relations Board, 24 N.W. (2d) 672, it was shown that a Wisconsin state statute authorizes making of contracts for closed shop between employer and employees. The higher court held that this state law does not conflict with the provision of the National Labor Relations Act. Hence an employee who had not joined the union and had been discharged pursuant to a closed shop agreement, which violated the state statute, was ordered reinstated.

This litigation involved an employee of the Rhinelander Paper Company.

For comparison, see Hill v. Florida, 325 U.S. 538. Here a state statute required business agents of labor unions to procure a license and prescribed their qualifications and made the issuance of the license depend upon a determination by a state officer that the agent possessed such qualifications as the state law prescribed.

The Supreme Court of the United States held this provision invalid because it deprived employees of the full freedom of choice as to their collective bargaining representative, given under the National Labor Relations Act.

Must Segregate

According to a recent higher court, unless funds, as bank deposits, of a corporation are segregated, the corporation must pay state taxes on the *full* amount of *all* deposits.

For instance, in Champion Paper & Fibre Company, 71 N.W. (2d) 302, the testimony showed the Champion Paper & Fibre Company is an Ohio corporation engaged in the manufacture of paper and pulp in Ohio and elsewhere. The corporation filed with the state of Ohio its annual corporation franchise tax report for the tax year 1945. This tax report set out the book value of all assets owned and used in Ohio in the sum of $28,355,859, and the book value of all assets owned and used outside of Ohio in the sum of $24,849,690.

The tax commissioner likewise made certain additions to and deductions from the total book value of all of the assets of the company, and determined the fair value of all of the assets of the company, wherever owned and held, in the sum of $51,833,786.

Included in the Ohio assets, as set out by the company, was cash in the amount of $7,000,467 which the company had on deposit in certain banks in Ohio and New York.

In none of these banks was there any segregation of bank accounts with respect to the particular sums of money which the company intended to expend in plant expansions and improvements in and with respect to the several manufacturing plants owned and operated by the company in Ohio and elsewhere.

Therefore, the higher court held that the Champion Paper & Fibre Company must pay tax to Ohio on *all* its bank deposits, saying:

"The Board finds that the tax commissioner did not err in including the deposits here in question and the moneys represented thereby as a part of the Ohio assets of the corporation in determining its corporation franchise tax liability. . . . The deposits here in question represented general reserves or balances belonging to said corporation and maintained in said banks for the purpose of the entire business of the corporation wherever transacted and must, therefore, be considered as located in the state of Ohio as the domiciliary state for the purposes of taxation."

Valuable Consideration

According to a late higher court decision a sale contract is valid and enforceable, although neither the buyer nor the seller proves that he paid or received "$1 and other valuable consideration" usually recited in a contract.

For illustration, in Coleman v. Whisnant, 37 S.E. (2d) 693, it was shown that a sale contract contained the usual clause "for $1.00 and other valuable considerations."

It was contended that the contract

was void because no proof could be given that the seller had received $1.00 and other valuable considerations."

The higher court held that in contracts of this nature it is not necessary for either the seller or purchaser to prove that the purchaser gave the seller this specified consideration.

Clayton Act

The Clayton Antitrust Act makes price discrimination unlawful only in case it tends to prevent competition. Therefore, a seller does not violate this law simply because he "cuts" prices *unless* the testimony *proves* that the lower price prevents competitors from taking business away from the "price cutter" which they might have secured had he not lowered his price below what he was charging elsewhere.

For illustration, in Samuel H. Moss, Inc., v. Federal Trade Commission, 148 Fed. (2d) 378, it was shown that a seller charged different prices for its merchandise in different localities.

The higher court held that the seller would have been guilty of violating the Clayton Act only if the testimony proved that the lower price prevented or "tended to prevent" any competitor from taking away business from the seller.

Also, this court explained that a seller is not guilty of violating the Clayton Act if he proves that his lower price did not undercut competitors, but merely "met" their "equally low price."

Must Prove Facts

Generally speaking, when merchandise is turned over to a common carrier with all steps taken which would insure delivery without further contingency to the consignee's places of business, the transaction takes place in the state in which the goods are delivered to the carrier. However, in suits between citizens of different states, the court requires positive proof of the facts.

For example, in Calcasieu Paper Company v. Carpenter Paper Company, 68 Fed. Supp. 201, it was shown that a seller delivered merchandise to a carrier in Louisiana for delivery to a purchaser in Texas.

The question presented the court was the shipper, by authorizing service of process against it in Texas upon the Secretary of State, consented to be sued in a federal court in Texas by the consignee?

The higher court held in the negative unless the testimony showed that the business out of which the suit arose was transacted or originated within Texas.

No Surtaxes

In St. Regis Paper Company v. Higgins, 157 Fed. (2d) 884, it was shown that the St. Regis Paper Company received dividends on stock of its subsidiary. The St. Regis Paper Company paid surtaxes in its federal income tax report based on the undistributed profits computed by including such dividends. Later, the St. Regis Paper Company repaid the dividends to its subsidiary.

The higher court held that the St. Regis Paper Company was not entitled to recover surtaxes, even assuming that it had held the dividends as a constructive trustee.

Also, see Bates Valve Bag Corporation v. Higgins, 157 Fed. (2d) 886, where the higher court held that the fact that the Bates Valve Bag Corporation was bound by the terms of an indenture, executed by its predecessor in accordance with debentures, not to distribute any income in certain years by cash dividends, this fact did *not* exempt the corporation from paying surtaxes on undistributed profits under the Revenue Act provision allowing a corporation credit against surtaxes.

Validity of Sales Tax

According to a late higher court decision a company need not pay a state sales tax on containers used to package its product, providing no refund is offered to purchasers for return of the containers.

For illustration, in State Board of Equalization, 156 Pac. (2d) 1, the testimony showed that a company purchased fiber containers to pack its products. This company made *no* reservation of title to the containers and it made *no* charge for these containers.

The higher court held the company not required to pay a sales tax on the containers.

Fair Labor Standards Act

Modern higher courts consistently hold that an executive is not within the scope of the Fair Labor Standards Act. But one who does manual labor and also acts as an executive part time must be paid wages specified by this Act.

For illustration, in Arkansas v. King, 157 Fed. (2d) 463, an employee named King sued his employer to recover unpaid overtime compensation, and an additional equal amount as liquidated damages.

The lower court entered judgment for $1,509.44, consisting of $629.72 for overtime compensation, an equal amount for liquidated damages, and $250 for an attorney's fee.

The employer appealed to the higher court on the ground that King was employed in a bona fide executive capacity.

The testimony showed that King had been engineer of the plant during all of the period involved, but his employer contended that he further had had charge of the manufacturing end of the business and of the employees in that department, and that during part of the time he had been assistant manager of both the manufacturing and selling operations of the plant. King testified that he kept the machinery in operation and in condition, but that a considerable part of his time was spent in assisting in loading merchandise, and repairing windows, screen doors, and other things around the plant. The higher court approved the lower court's verdict, and said:

"It is not contended that the plaintiff (King) was in *sole* charge of an independent establishment or a physically separated branch establishment. Therefore, it cannot be said, in view of the testimony, that the plaintiff was employed in a bona fide executive capacity."

Court Allows Compensation

In Christy v. Brown Paper Mill Company, Inc., 27 So. (2d) 917, it was shown that an employee of the Brown Paper Mill Company, Inc., was injured when a large suspended reel of paper he was guiding from one part of the plant to another broke loose from its attachments, fell to the floor, and in doing so struck him a glancing blow.

Certain physicians testified that the employee's injuries were not serious enough to justify payment of compensation under the State Workmen's Compensation Act. But the employee's wife testified that he is restless at night; that his strength is so limited that he cannot even carry his child in his arms, and always fails when he tries to do any work that requires much physical effort. Several of the employee's friends and neighbors testified to his ability to do heavy work prior to the accident and that he regularly engaged in such work for a living.

Although the lower court refused to grant compensation, the higher court reversed the verdict, and said:

"It does not comport with reason to think that plaintiff, a young, energetic, robust man with wife and child dependent upon him for support, would be willing, in this day of high wages and easy money, to be satisfied with an income of $19.50 per week if he could avoid doing so. His good record for continuous hard work argues strongly against such an idea."

Paper SKETCHES . . . . . .

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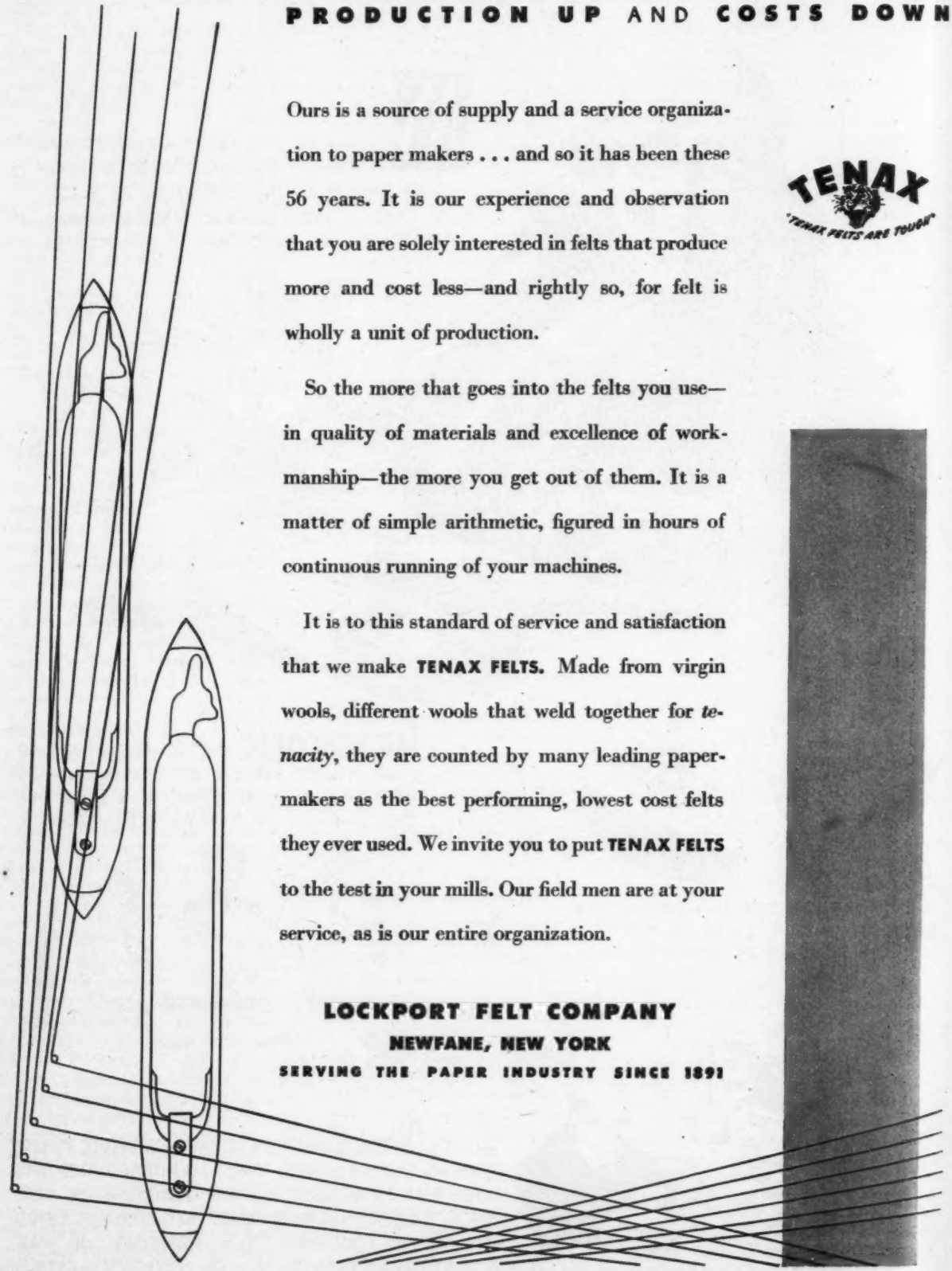

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Superintendents Hold 27th Annual Meeting in Chicago

Homer H. Latimer, retiring president of The American Pulp and Paper Mill Superintendents Association

Raymond F. Bennett, newly-elected president of The American Pulp and Paper Mill Superintendents Association

▶▶▶ FOR THE FOURTH TIME The American Pulp and Paper Mill Superintendents Association held its annual meeting in Chicago. The meeting this year, the Association's twenty-seventh annual convention, was held at the Edgewater Beach Hotel, May 22 to 24. The Silver Anniversary meeting was held at the same hotel in 1944 at about the same time in May. The Association's first two conventions, 1919 and 1920, were held at the Congress Hotel, in Chicago.

The membership of the Association now numbers 1,145, and the registration for the meeting this year touched 700. The fellowship and common interest of this group of men always are manifested whenever they are brought together, and the remarkable growth of the Association and its part in the industry brings many reminiscences. Aside from those recollections, there was little looking backward over the several rugged years that have passed, for these men were concerned with a multitude of postwar adjustments. The tremendous task confronting them was that of producing more and better paper under the existing conditions. Back of that very simple statement of fact, however, loomed many grave obstacles—adequate supplies of raw materials, development of new processes, increased technical skill, new and modern equipment, more and better transportation, competent personnel, controversial labor matters, economies, management and customer satisfaction—all fraught with many aspects peculiar to each group of papers and board.

The convention was formally opened on the morning of the twenty-second by President Homer Latimer. After a few words of welcome, he introduced the Rev. Benjamin M. Will, pastor of the Country Church of the City, Chicago, who delivered the invocation. Then, when the Association's secretary-treasurer, George W. Craigie, read the names of those members who had passed away during the year, the audience paid a silent tribute to their memory.

President's Address

President Latimer then delivered a short message in which he reviewed the activities of the Association during the past year. He said:

Following a custom established by my predecessors in office, I shall, in the capacity of your president, give a brief review of Association activities during the past fiscal year.

The customary term of office of an Association president is one year. In the life of a busy man a year passes quickly and, despite the best of intentions, it sometimes happens that contemplated projects and plans are never executed and frequently forgotten. This results from lack of continuity of thought as one man leaves office and his successor assumes new responsibilities. With this thought in mind there has been created a group known as the Planning Committee, the duty of which is to give advice and counsel to the newly elected officers, both National and Divisional, and assist in carrying prolonged projects and plans through to logical conclusion. It is believed that the formation of this Committee will result in a better functioning of Association work, assist our Affiliates in such projects as they may undertake, and further the industry of which we, either directly or indirectly, are a part.

There was held in Middletown, Ohio, during the past year, a General Maintenance Conference at which time ways and means of maintaining pulp and paper mill equipment were discussed in an informal manner by men who are experts in their respective fields. I was present at this Conference and consider it to have been of great value to those in attendance. It is quite possible that similar conferences will be repeated in the various divisional areas.

At a meeting of your directors held at Poland Springs, Maine, in June, 1946, a committee was appointed to revise our Constitution. Under date of April 1, 1947, letters were addressed to all members giving notice of and reasons for the proposed revision. These letters were accompanied by copies of the constitutions, both present and tentative. The proposed constitution will be submitted for your

approval or rejection during this convention. An enormous amount of work was required in the preparation of the proposed revision. For this I extend my personal thanks to the committee, consisting of Ray Barton, Grover Keeth, and Stanford Blankinship.

Since the tenure of office of an Association president is of so short duration it may be stated, with slight chance of disagreement, that the Association is only as good as its Secretary. George Craigie, our secretary-treasurer is conscientious in his work and constructive in his thinking. To him I wish to express my personal appreciation.

John Cornell, John O'Brien, and their associates on the staff of our official organ, the *Paper Mill News*, have performed in excellent manner. This was particularly noticeable during the past year.

The second Bolton Award contest was conducted during the Association fiscal year. I wish to thank John W. Bolton and Sons, Inc., for fostering this project.

Our Affiliate Members are mentioned in commendatory manner due to their help to us as individuals and the initiative indicated by their various suggestions. Plans for the future should result in still greater mutual advantage.

My term of office, due to the unusual consideration extended me by all whom I consulted, has been both pleasant and educational. I thank you for the honor you have done me and pledge my loyal support to all who follow in my footsteps.

Following his address the President appointed two committees:

Auditing: Raymond F. Bennett, chairman; Ollie W. Messner, and Walter Wolfe.

Resolutions: Harry E. Weston, chairman; Howard Street, and Sam Olsen.

New Officers

The first half, or business session, of the morning meeting was concluded with the election of new officers for the coming year.

President—Raymond F. Bennett, Ecusta Paper Corporation, Pisgah Forest, N. C.

First Vice President—Ollie W. Messner, Robertson Paper Box Company, Inc., Montville, Conn.

Second Vice President—Charles H. Reese, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Third Vice President—James Fish, Paterson Parchment Paper Company, Bristol, Pa.

The board of directors of The American Pulp and Paper Mill Superintendents Association, Inc., met at the Edgewater Beach Hotel, Chicago, the day preceding the official opening of the Association's convention. Left to right: Walter F. Wolfe (Mac Sim Bar Paper Co.), Ray C. Winkler (Chemical Paper Co.), Ollie W. Messner (Robertson Paper Box Co.), Raymond F. Bennett (Ecusta Paper Corp.), Ray Barton (Michigan Paper Co.), Fred Boyce (Wisconsin Paper & Products Co.), William Brydges (past president Superintendents Association), Homer H. Latimer, Association President; George W. Craigie, secretary-treasurer; Mrs. Florence Kavanagh, recording secretary; H. A. Brawn (Miamisburg Paper Co.), F. L. Zellers (Chillicothe Paper Co.), James Fish (Paterson Parchment Co.), Grover Keeth (Marathon Corp.)

Fourth Vice President—Charles E. Ackley, Crown Zellerbach Corporation, Port Angeles, Wash.

Fifth Vice President—Glen Sutton, Sutherland Paper Company, Kalamazoo, Mich.

Two Addresses on White Water Waste

The remainder of the first morning was given over to the subject of "Waste in White Water." Two speakers addressed the meeting: Frederic C. Clark, of Frederic C. Clark Associates (consulting engineers), and Arthur Thurn, of The Champion Paper and Fibre Company, Hamilton, Ohio.

Mr. Clark, who is in charge of construction design at the new plant of the Miamisburg Paper Mill Division of the American Envelope Company, spoke of the system that has been designed for this plant at Miamisburg, Ohio. He amplified his talk with slides, one of which illustrated the layout of the white water system. He explained the plan as one designed to reduce the flow of water to at least 5,000 gallons per ton—eventually they hope to reduce it to 2,000 gallons per ton. It is planned to reuse all water except that which comes from the dryers. This will be diverted because of trouble from woolen fibers.

Mr. Thurn put his treatment of the subject into the form of a question, "How Cheap Is Water?" He followed this question by asking another, "Is water the cheapest of papermaking raw materials?" He then said he would not admit it, nor did he believe the audience would. He did *say*, however, that some papermakers admit as much, even more, because if asked to name two or three of the most important papermaking materials, how many would include "water?" And yet, water is as necessary as pulp for making paper.

A sizable audience stayed through both of the two addresses and listened with deep interest.

Separate Luncheons for the Men and Women

Two luncheons were held on the first day of the meeting. Instead of a general luncheon such as has been held at many former conventions, there was a men's luncheon and a ladies' luncheon.

The luncheon for the men was held in the popular Marine Dining Room of the Hotel with President Latimer presiding. The guest speaker at the luncheon was James M. Cleary, advertising executive, Roche, William & Cleary, Inc., Chicago. Reuben Robertson, Jr., executive vice president, The Champion Paper and Fibre Company, Hamilton, Ohio, had been scheduled to speak at the luncheon, but he was unable to attend.

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In the picture at the left, the president's jewel, awarded by the Association to each retiring president, has just been presented by Fred Boyce, the Association's first president, to Homer H. Latimer, retiring president. Two of the Association's vice presidents are shown in the picture to the right: Charles E. Ackley (left) was elected fourth vice president and Ollie W. Messner is now first vice president

Mr. Cleary, who has served on the Committee of Economic Development, gave a very comprehensive outline of the work carried on by this organization. Pointing out the aim of the Committee, the speaker said that four years ago it had "publicized its conclusion that a postwar goal of from 53 to 56 million civilian jobs not only was necessary if we were to avoid mass unemployment, but also was attainable . . . Today, the civilians employed in the United States number far more than the maximum set by the CED, and at least ten million more than in 1940—our peak peacetime year."

The speaker stated that "never before has there been such a thorough, impartial, objective study of the basic economic problems confronting the nation . . . Never before have businessmen won so much acceptance from representatives of labor, agriculture, and government.

"There are 96 businessmen on the CED Board of Trustees. Of this number, 15 constitute a Research and Policy Committee . . . This committee of businessmen has appointed a Research Advisory Board of eight of the top social scientists in the United States . . . It also has employed a Research Staff headed by Prof. Theodore Yntema, on leave from the School of Business of the University of Chicago."

Turning from the economic side of the picture, Mr. Cleary said "the CED is fighting for more than a high standard of living . . . CED is fighting for human freedom—real freedom . . . More than 40 billion people have lived since the dawn of the Christian era, and less than 1 billion of them have known the kind of freedom we are talking about—the kind of freedom Americans have enjoyed."

The women's luncheon, held in the West Lounge of the Hotel, was a gay and delightful occasion. In the absence of Mrs. Homer H. Latimer, wife of the presiding president, Mrs. Raymond F. Bennett, wife of the newly-elected president, acted as hostess.

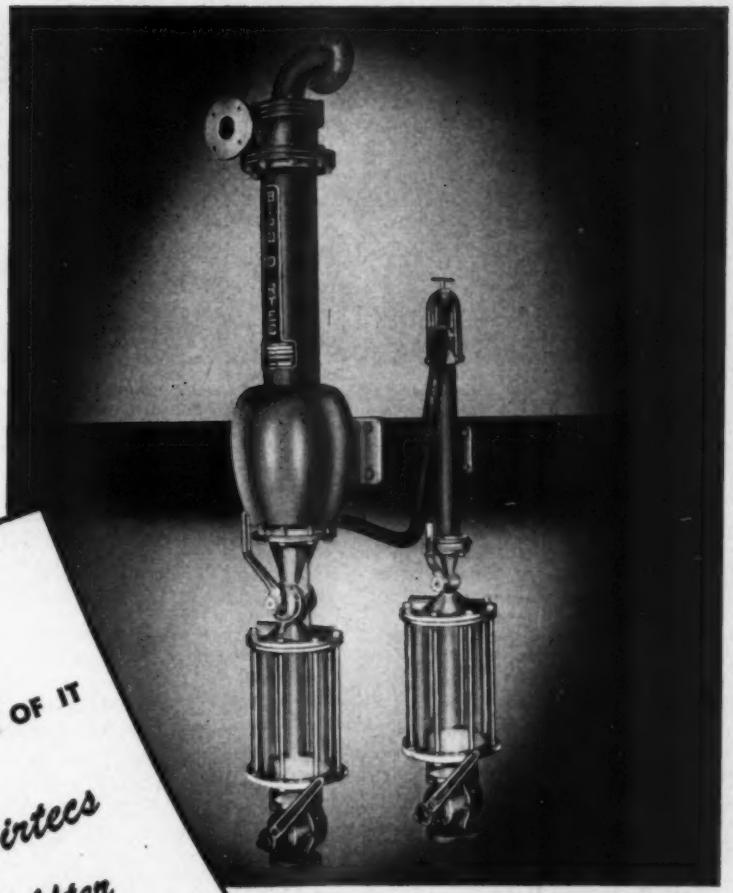
The ladies were entertained following the luncheon by Bill Dornfield, well known humorist and magician. Few entertainers can offer such a rapid succession of legerdemain mysteries accompanied by a spontaneous flow of witticisms. The luncheon furnished real fun and relaxation for many of the ladies who had spent the forenoon shopping or sightseeing.

Labor Relations

One of the most dynamic addresses on the program was the talk given on the afternoon of the first day by De Loss Walker, an industrial counsellor of note. He has traveled widely and devoted himself to years of study and research on economic problems. In addition to his work with industry, Mr. Walker has been associate editor of *Liberty* magazine; he also became co-founder of the National Recovery Crusade. Speaking directly to the superintendents, he said: "Your success and that of your company is found in production, more production, and production at lower cost. This is the only answer to our distressing problems; it is the only way to prevent a disastrous depression . . . Your job requires understanding. First, of our economic order; second, of the fallacies concerning it; third, of the handling of men; fourth, of the men whom you must handle.

"Higher wages and higher prices are in no way the answer to our present needs. Why? Because money is not wealth, and these higher wages and prices are in terms of money—which can have value only when it can be exchanged for wealth (or services) which have been produced. Hence, as we increase pay but not production, and raise prices, but not quality or innovations, we head straight for a blowup."

Mr. Walker asserted that the world and America are poor—poorer than they have been since before the war. He said that American civilization is getting soft. He made this comparison: The difference between the horse age and the machine age is that when the horses went too fast and we wanted them to stop, we said "whoa! whoa!" But in this machine age, when we want things to stop, we try to speed them up *faster*. The speaker pointed out that down through history, the same cycle was repeated over and over —"from shirt sleeves to shirt sleeves in four generations." He went on to say that there never can be overproduction in America if the men who produce are smart enough to know what the consumer wants but *do not give him too much of it.*



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Before and After
Your Bird Screens

Ahead **of the Screens, the Dirtec does a beautiful job of removing heavy and fine dirt differing in specific gravity from the fibres. Employing pressure-drop it yanks the dirt away from the stock and detours it neatly and completely out of the system. Costs little to install, operate and maintain.**

After **the Screens as a tailings unit, the Dirtec has become standard practice. It handles a big volume of tailings, thereby increasing screening efficiency, and it permits recirculation of the cleaned stock with virtually no fibre loss. Compact, easy to install, it's the ideal tailings unit.**

Want layouts and estimates?

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SOUTH WALPOLE • MASSACHUSETTS

At the get-together party on Friday evening, the photographer found these three past presidents of the Association: (L to R) H. H. Harrison (Crystal Tissue Co.), Fred Boyce, who was the Association's first president; William H. Brydges, and Mrs. H. H. Harrison. Pictured at the right is Richard "Red" Smith, coach of the Chicago Cubs baseball club, who appeared on the program at the banquet which followed. At his left are E. C. Jacobi (Sandy Hill Iron & Brass Works), and E. J. Robinson, of "Green Bay Press Gazette"

Group Meetings

Friday was devoted to group meetings. Presiding over these eight sessions were the following:

Chemical Pulp

Chairman—Harold Skinner, Marathon Corporation, Rothschild, Wis.

Co-chairman—R. K. Prince, Allis-Chalmers Manufacturing Company, Milwaukee.

Power and Plant Engineers

Chairman—Harold Suhs, Sorg Paper Company, Middletown, Ohio.

Co-chairman—W. W. Cronkhite, General Electric Company, Schenectady, N. Y.

Tissue

Chairman—Lee M. Bauer, Ecusta Paper Corporation, Pisgah Forest, N. C.

Co-chairman—F. K. Becker, Bird Machine Company, South Walpole, Mass.

Coated Papers

Chairman—Henry Baldwin, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis.

Co-chairman—Robert Van Kirk, Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.

Fine Papers

Chairman—Charles Reese, Nakoosa-Edwards Paper Company, Port Edwards, Wis.

Co-chairman—Percy Tigwell, Beloit Iron Works, Beloit, Wis.

Woodroom and Woods Operations

Chairman—Walter J. Brown, Brunswick Pulp and Paper Company, Brunswick, Ga.

Co-chairman—C. L. Durkee, D. J. Murray Manufacturing Company, Wausau, Wis.

Board

Chairman—Glen Sutton, Sutherland Paper Company, Kalamazoo, Mich.

Co-chairman—Frank Eilers, Orr Felt and Blanket Company, Piqua, Ohio.

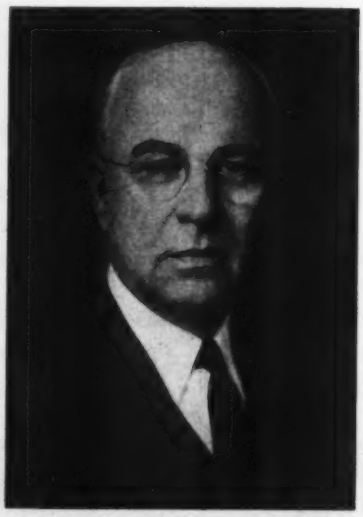
Kraft

Chairman—Roland Wilber, Southern Paperboard Corporation, Port Wentworth, Ga.

Co-chairman—S. N. Bratton, Pusey & Jones Corporation, Wilmington, Del.

The program called for the presentation of twenty-four papers at the eight group sessions. However, the Chemical Pulp Group had arranged panel discussions instead of formal papers, and a film presentation formed part of the program of the group on Woodroom and Woods Operations.

[*Abridgments of a number of the papers presented at these sessions will appear from month to month in the section of this magazine devoted to Convention Papers . . . Abridged.*]



George W. Craigie, secretary-treasurer of The American Pulp and Paper Mill Superintendents Association

Get-Together Party and Banquet

The banquet, always the climax of the convention, is a time when good fellowship takes over; when honors are given for service to the Association; when members and their guests shut out the penetration of business problems and enjoy a full evening of relaxation and amusement.

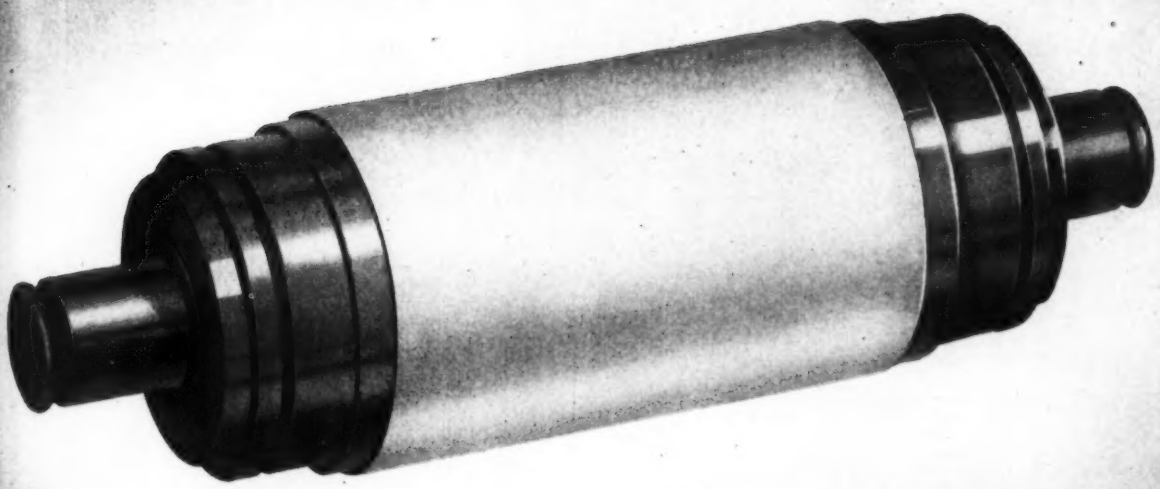
The get-together party, sponsored by the Industrial Affiliates, has become a very popular prelude to the festivities of the evening. This occasion took over the East and West Lounges of the Hotel on Friday evening, starting about six o'clock. It was really a carnival-like period of greetings and fun. Practically everyone attending the convention was there and enjoyed the little social amenities that leave pleasant memories of the convention each year. The men wore gay paper hats; the ladies wore beautiful gardenia corsages, while roving accordion players inspired impromptu barber shop quartets to break forth into familiar song. The festivities broke up with the capturing of bright balloons and a drawing for door prizes.

The Ballroom of the Hotel where tables were set for the banquet which began at 7 o'clock was filled to capacity.

On the platform, the speakers table was set in two tiers: at the first table were the Association officers; seated at the second table were speakers of the evening and other program participants.

President Latimer presided over the ceremonies which followed the dinner with a spontaneity, witticisms, and good humor which combined to make the evening one that will long be remembered.

One feature of the program that evening, not scheduled, brought an innovation when Norman Weil (W. S. Tyler Company), a past chairman of



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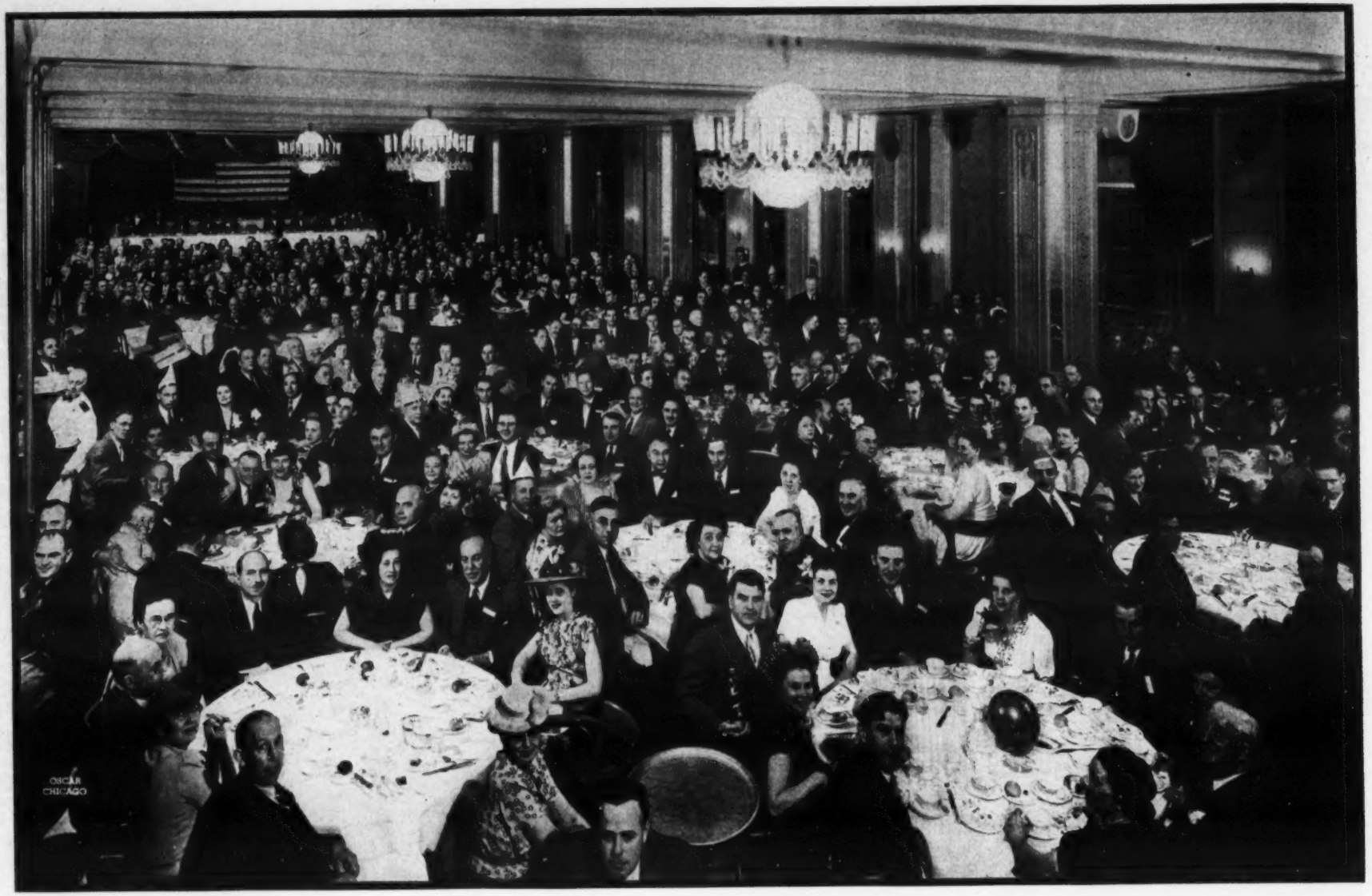
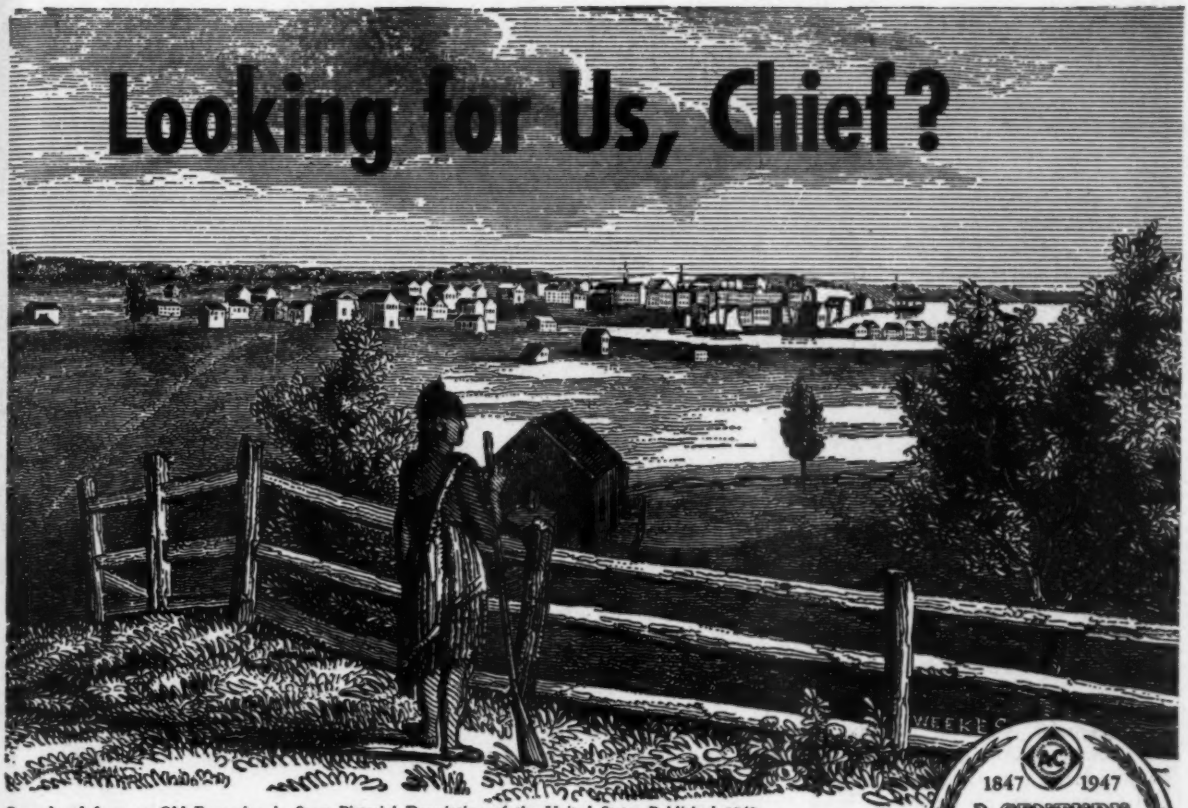


A capacity crowd filled the Ballroom of the Edgewater Beach Hotel for the Superintendents annual banquet on Friday evening

Looking for Us, Chief?



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1847 1947
A CENTURY OF SERVICE
to Industry
THAT MADE
America Great

WE WERE HERE WHEN MILWAUKEE WAS SPELLED M-I-L-W-A-U-K-I-E!

MILWAUKIE, 1847 — A frontier settlement celebrates its first birthday . . . and a small factory turns out its first product—*millstones.*

One-hundred years later, in 1947, this progressive city salutes its oldest heavy machinery manufacturer—Allis-Chalmers . . . *one of the Big 3 in electric power equipment—biggest of all in range of industrial products!* Today, practically every U. S. manufactured product is aided in its course by Allis-Chalmers equipment.

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We are proud to serve this basic pattern of American life: Power and Electrical — Mining and Rock Processing—Ferrous and Non-Ferrous Metal Producing — Metal Working — Food — Textile — Chemical — Petroleum — Wood — Rubber — General Manufacturing — Transportation — Construction — Public Works — Agriculture — National Defense. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

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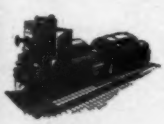
One of the Big 3 in Electric Power Equipment
Biggest of All in Range of Industrial Products



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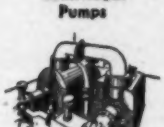


Marine & Defense Equipment

Farm & Industrial Tractors

A 2192

These pictures must have been caught while some group was singing "There are smiles that make us happy." In the center of the group at the left, Charles E. Ackley, the Association's fourth vice president (Crown Zellerbach Corp.), stopped long enough to be photographed with Mrs. E. M. Root and Mr. Root (Dilts Machine Works). At the right, Chicago greets Savannah as they all enjoy the party. (L to R) Mrs. John G. Bucuss, Mrs. Roland Wilber, Mr. Wilber (Southern Paperboard Corp. Savannah, Ga.), and Mr. Bucuss (Acme Steel Co.)

the Industrial Affiliates, brought to the microphone Richard "Red" Smith, coach of the Chicago Cubs baseball club, also coach of the New York Yankees professional football club. Weil and "Red" regaled the audience with a radio skit which brought a round of applause. But a special significance attached to the performance when some of the old-timers on the platform recalled that "Red" Smith really got his start from the paper industry—his father, Paul A. Smith, was a superintendent with Combined Locks Paper Company. The records have since revealed that Paul A. Smith served as temporary secretary at the meeting held in June, 1919, at Appleton, Wisconsin, at which time the Superintendents Association had its inception. [The June, 1919, issue of *The Paper Industry*, Vol 1, No. 3, contained an article by Mr. Smith entitled "The Duties of a Backtender."]

Presentations

Although certain presentations are made each year at the banquet and do not exactly come as a surprise, there is, however, a new tone of appreciation each time such awards are given and the sincerity that goes with them remains constant.

The Past President's Jewel, awarded by the Association to each retiring president, was presented to Homer H. Latimer by the Association's veteran past president, Fred Boyce. Mr. Boyce, first president of the Association, told of his early acquaintance with Tom Latimer, father of the recipient. In his thanks to the Association and Mr. Boyce, Mr. Latimer said he particularly wanted to thank Mr. Boyce, not so

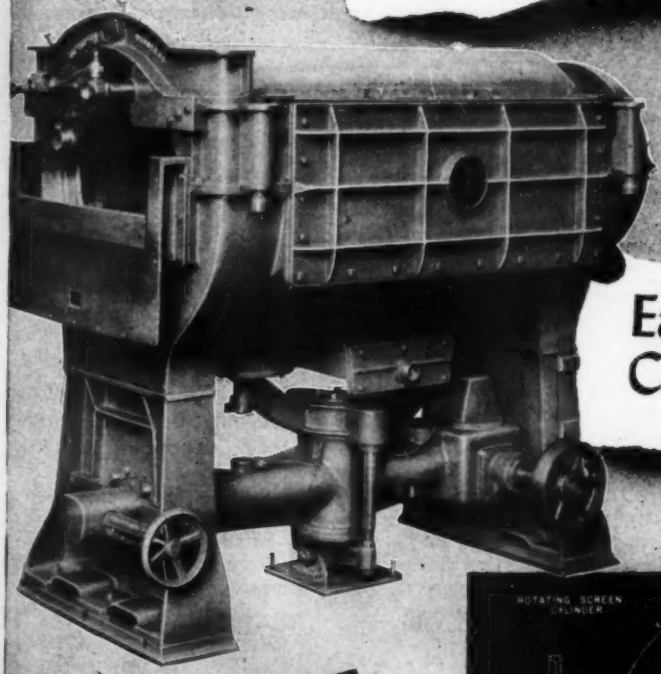
The fun was well under way when these pictures were taken, but the balloons had not been released. The five people in the foreground of the illustration at the left are: F. E. Moser (Sorg Paper Co.), R. F. Vokes (Dilts Machine Works), Mrs. Claude Sorg, Tony Agronin (Shartle Brothers Machine Co.), and Mr. Sorg (Sorg Paper Co.) It could have been a toast to something that pleased the two couple shown at the right: Mrs. F. W. Johnson and Mr. Johnson (Rhinelander Paper Co.), with R. O. Herbig (Reliance Electric & Engineering Co.) and Mrs. Herbig

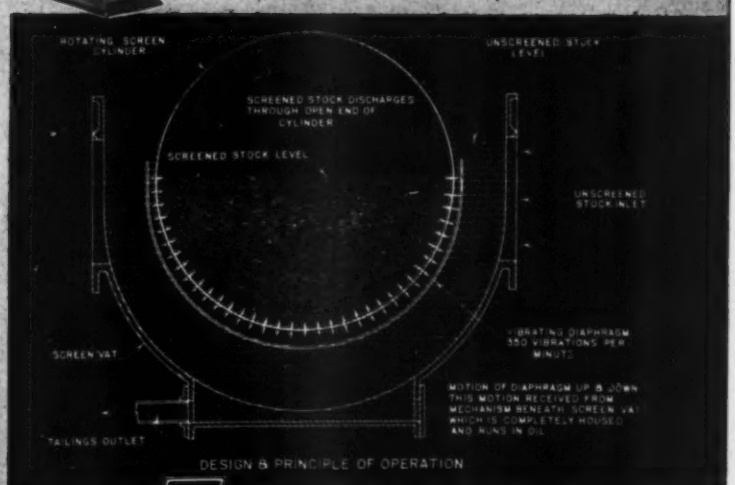
Gentle Screening Action
Correct Stock Agitation

Eliminates Dirt and
Lumps from Stock

Passes Uniform
Fibres . . .
Perfectly Mixed

Easily Cleaned . . .
Completely Accessible




ROTATING SCREEN CYLINDER
UNSCREENED STOCK LEVEL
SCREENED STOCK DISCHARGES THROUGH OPEN END OF CYLINDER
SCREENED STOCK LEVEL
UNSCREENED STOCK INLET
SCREEN VAT
VIBRATING DIAPHRAGM 550 VIBRATIONS PER MINUTE
MOTION OF DIAPHRAGM UP & DOWN THIS MOTION RECEIVED FROM MECHANISM BENEATH SCREEN VAT WHICH IS COMPLETELY HOUSED AND RUNS IN OIL
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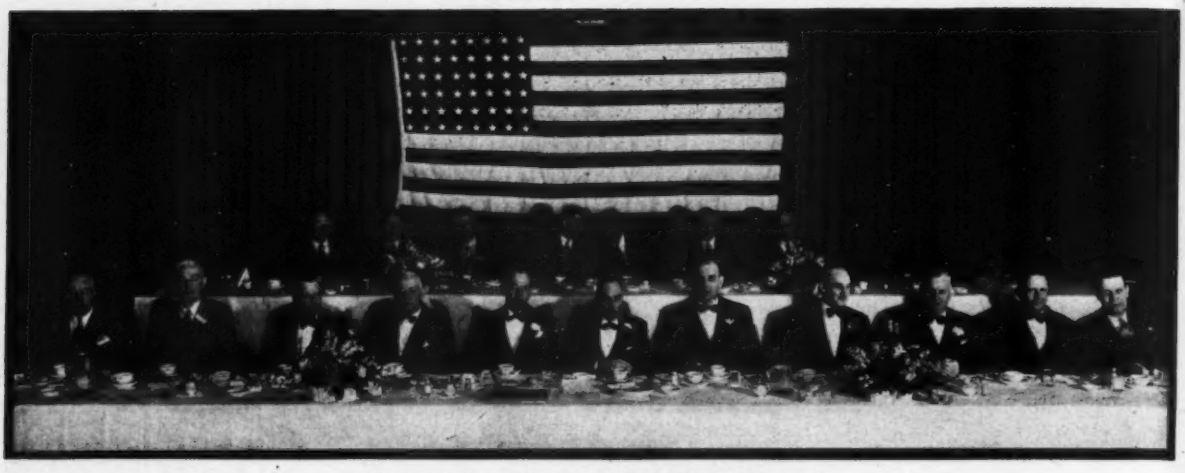
The JONES SCREEN

Jones

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills



The speakers table at the Association's banquet

much for what he said about him, but what he said about his father. He added, touchingly, that he hoped he might accomplish as much as his father did.

The L. D. Post Memorial Trophy is awarded the retiring president each year by John O'Brien and John Cornell, co-publishers of *Paper Mill News*, official organ of the Association. The award this year, a fine Hamilton watch, was presented to Mr. Latimer by Mr. O'Brien.

Following a brief interlude, Norman Weil again took over temporarily, and called to the microphone, William Brydges, a past president of the Association. He acted for the Association in presenting gifts to Mrs. Raymond F. Bennett, wife of the incoming president, and handing to Mr. Latimer a gift to be presented by him to Mrs. Latimer, who was not present at the meeting. While Mr. Brydges was still at the microphone, Ray Bennett stepped up and presented him with a life membership in the Association. Mr. Brydges retired from active duty during the past year.

Seated at the speakers table beside George Craigie, the Association's secretary-treasurer, was the former secretary-treasurer, "Bob" Eminger, who retired in 1944. There was a hearty round of applause and greeting from the audience when Mr. Eminger was introduced. Raymond F. Bennett, the Association's new president was introduced and he told the audience that he looked forward to a very successful year, with their co-operation.

The entertainment of the evening was topped off by the ingenious exhibits of the main speaker. Professor Russell Oakes, well-known humorist and lecturer, who demonstrated some of his "Goofy Gadgets."

Last Session

The final session of the convention on Saturday morning was presided over by Raymond F. Bennett, newly-elected president. Two papers were presented at this meeting. "High Density Pulping and Pumping," was the subject of an address by Tany Agronin, Black-Clawson Company. The other, "Single Rotation Refiner," was given by Lyonel M. Sutherland, Sutherland Refiner Corporation.

The remainder of the forenoon was given over to a panel discussion on Stock Preparation, led by Robert F. Vokes, Dilts Machine Works, as moderator.

After lunch, the Association members convened by a final business meeting in the East Lounge. At this meeting the following resolutions prepared by the Resolutions Committee, Harry E. Weston, chairman, were read and approved.

Two presentations made at the banquet were the L. D. Post Memorial trophy and a life membership in the Association. At the left, Jack O'Brien, of "Paper Mill News," is shown just after he has presented to Homer H. Latimer, retiring president, the Post trophy, a fine Hamilton watch. At the right, William H. Brydges, a past president, receives from Raymond F. Bennett, newly-elected president, a life membership in the Association

The steam gauges tell how you can step up production with Lukenweld Jacketed Drier Rolls

(PATENTS APPLIED FOR)

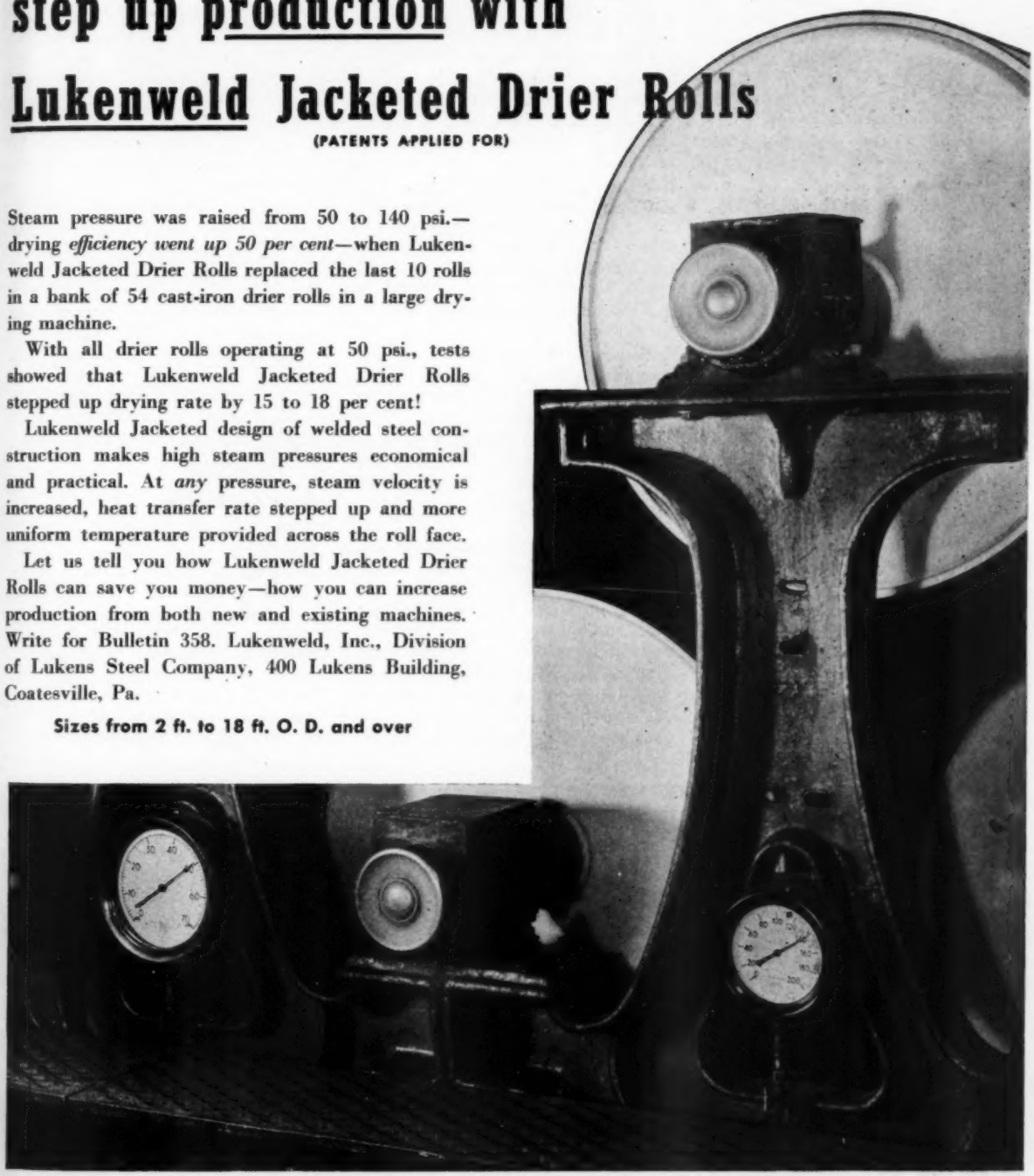
Steam pressure was raised from 50 to 140 psi.—drying *efficiency went up 50 per cent*—when Lukenweld Jacketed Drier Rolls replaced the last 10 rolls in a bank of 54 cast-iron drier rolls in a large drying machine.

With all drier rolls operating at 50 psi., tests showed that Lukenweld Jacketed Drier Rolls stepped up drying rate by 15 to 18 per cent!

Lukenweld Jacketed design of welded steel construction makes high steam pressures economical and practical. At *any* pressure, steam velocity is increased, heat transfer rate stepped up and more uniform temperature provided across the roll face.

Let us tell you how Lukenweld Jacketed Drier Rolls can save you money—how you can increase production from both new and existing machines. Write for Bulletin 358. Lukenweld, Inc., Division of Lukens Steel Company, 400 Lukens Building, Coatesville, Pa.

Sizes from 2 ft. to 18 ft. O. D. and over



Working surfaces of Lukenweld Jacketed Drier Rolls may be carbon or low alloy steel, solid stainless steel, Monel or other nonferrous metals, or clad steels.

LUKENS
LUKENWELD DIVISION

LUKENWELD, INC.

DRIER ROLLS AND DRYING MACHINERY FOR MORE PRODUCTION

Resolutions

WHEREAS, The demands for paper still continue to be greater than the supply; be it

Resolved, That greater emphasis be placed by The American Pulp and Paper Mill Superintendents Association in its assembled meetings, especially meetings of the various divisional groups, to ways and means of closing up this undesirable gap.

WHEREAS, The present high cost of building construction, the continued scarcity of certain fibrous and chemical raw materials, and the delayed delivery of purchased machinery and equipment continue to harass the pulp and paper industry; be it

Resolved, That every member of The American Pulp and Paper Mill Superintendents Association, each in his respective mill, do everything possible to improve present operating efficiencies and thus increase productive capacity of existing equipment.

WHEREAS, There is a growing scarcity of most desirable pulp-making woods; be it

Resolved, That this Association and its members take immediate steps to exploit the use of other species through careful selection and proper conversion.

WHEREAS, There is an increasing need for more knowledge about paper by the printing industry and by the entire converting trade; be it

Resolved, that some effort be made by The American Pulp and Paper Mill Superintendents Association to bring about a better exchange of information between the industry and the users of its products.

WHEREAS, Members of The American Pulp and Paper Mill Superintendents Association always have been interested in the bettering of working conditions in the industry; be it

Resolved, That the subject of Labor Relations continue to receive due consideration in the agenda of future meetings — both national and divisional.

WHEREAS, Homer H. Latimer has given so generously of his time and ability to the advancement of the affairs of The American Pulp and Paper Mill Superintendents Association during his tenure of office as president and for a number of years previous to his election to that office; be it

Resolved, That he receive the sincere thanks of each member of the Association for this contribution to the welfare of the entire group.

WHEREAS, John W. Bolton and Sons Company is continuing its outstanding Bolton Award Contest as a means to better human relations in the industry; be it

Resolved, That members of the Association give careful thought to the contest about to be announced on the subject of Safety in Pulp and Paper Mills and submit their ideas on how mill safety records can be improved.

WHEREAS, The Allied Industrial Affiliates of the Association, under the chairmanship of Ralph W. Kumler, has continued in its forward moving activities for the welfare and growth of the Association; be it

Resolved, That this group receive the hearty thanks of each and every member of the Association.

WHEREAS, George W. Craigie, secretary-treasurer of the Association, has handled the many details of his office so ably and willingly, always ready to lend a hand wherever needed; be it

Resolved, That the Association membership acknowledge this definite contribution to the well-being of the organization.

WHEREAS, The Association has received splendid support of the *Paper Mill News,* official organ of the Association, and of the other publications serving the pulp and paper industry in the dissemination of news pertaining to its activities; be it

Resolved, That this recognition serve as a record of the appreciation of the Association for this support.

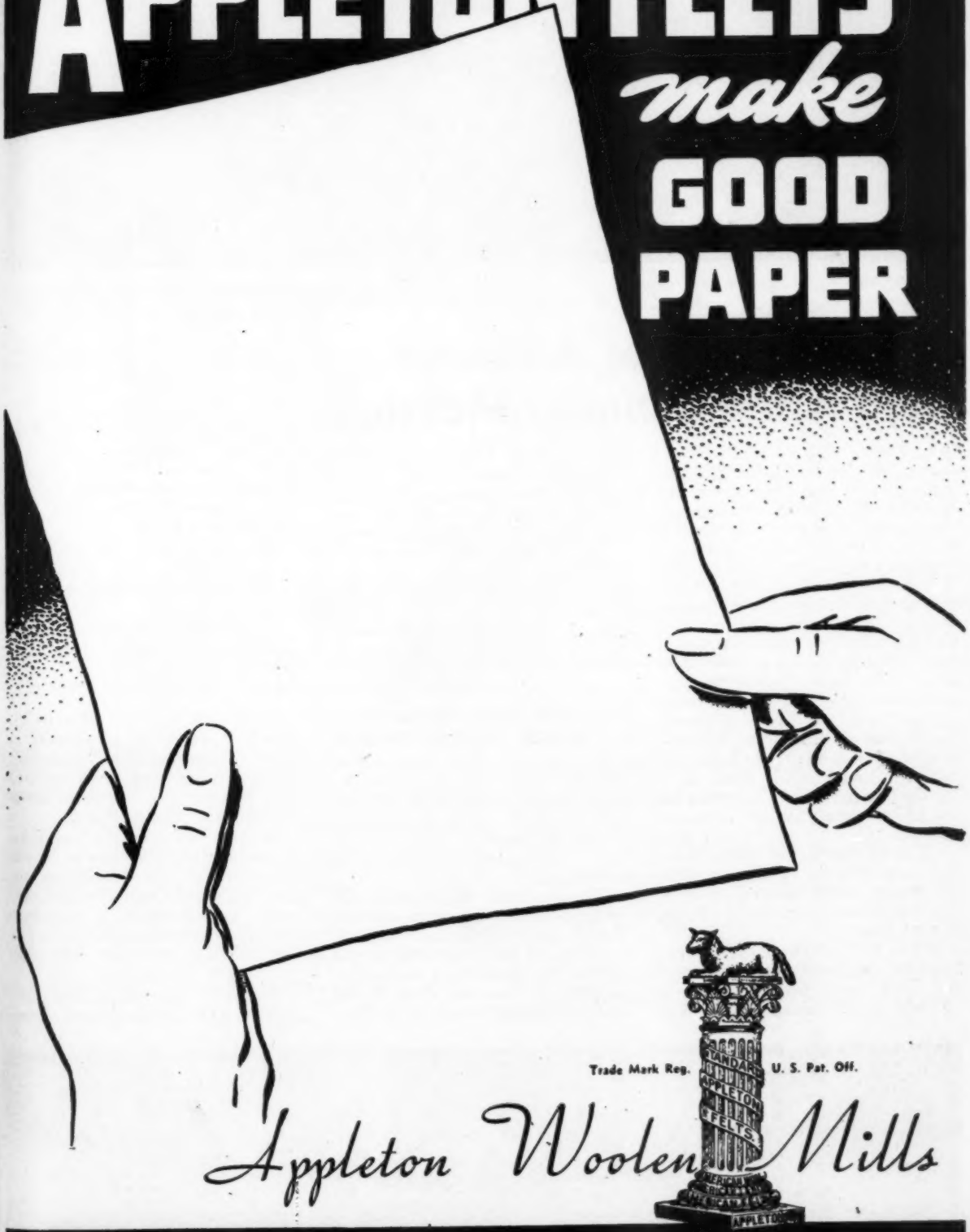
Respectfully submitted: Harry E. Weston, chairman; S. R. Olsen, Howard H. Street.

Next Convention in Dixie

At the meeting of the Association's Board of Directors, held on the 22nd, just prior to opening of the convention, it was decided to hold the 1948 Convention in New Orleans, Louisiana. Headquarters will be the Roosevelt Hotel; the dates, May 18, 19 and 20, 1948. As the members said their good-bys at the Edgewater Beach Hotel, there were many who said "See you next year ''way down South'."

The annual ladies night dinner dance of the Michigan Division of The American Pulp and Paper Mill Superintendents Association was held in the Park-American Hotel, Kalamazoo, Saturday evening, May 3. Shown at the speakers table (L to R) are: O. W. Callighan, Edgar Brothers Co., Division secretary; Raymond L. Barton, Michigan Paper Co., past president of the national association; Harris O. Ware, Hercules Powder Co., banquet toastmaster; Carl Hoelderle, Anheuser Busch Co., who was chairman of the Allied Industries' pre-dinner cocktail party; William H. Astle, Michigan Paper Co., program chairman; Herbert Johnston, Allied Paper Mills, a member of the ladies night committee; Glen Sutton, Sutherland Paper Co., also on the committee. Talking across the table at the right is Walter F. Wolfe Mac Sim Bar Paper Co., Michigan Division chairman

APPLETON FELTS *make* GOOD PAPER



Trade Mark Reg. U. S. Pat. Off.

Appleton Woolen Mills

APPLETON • WISCONSIN

Industrial Affiliates held annual dinner meeting at the Edgewater Beach Hotel, Chicago, Wednesday evening prior to official opening of Superintendents Annual Convention

Allied Industrial Affiliates Hold Annual Dinner Meeting

▶▶▶ THE ANNUAL DINNER meeting of the Industrial Affiliates was held in the Michigan Room of the Edgewater Beach Hotel, Chicago, on the evening of May 21. Ralph W. Kumler, chairman of the Affiliates Committee, presided at the dinner. Informal talks were made by Homer H. Latimer, president, and George Craigie, secretary of the Superintendents Association. Both of these gentlemen spoke of the mutual work of the Affiliates and the Association and the close co-operation that had existed during the past year. Mr. Kumler reviewed the activities of the Affiliates and commended the members of the Industrial Affiliates Committee who served during the year just ended. The roster of the Affiliates now totals 130 corporate members.

A new Committee of ten members was nominated by a three-member nominating committee and the following new members were elected for the coming year:

Walter B. Morehouse, Nopco Chemical Company, representing the Chemical Group

David C. Murchison, Georgia, Kaolin Company, representing Non Fibrous Raw Material Group

J. H. Loomis, Calco Chemical Division of the American Cyanamid Company, representing the Dyestuff Group

Leon H. Smith, The Downingtown Manufacturing Company, representing the Paper Machine Manufacturers Group

R. K. Prince, General Machinery Div. of Allis-Chalmers, representing the Pulp Mill Machinery Group

Paul Boronow, Valley Iron Works, representing the Auxiliary Equipment Manufacturers Group

Frank E. Hutton, Babcock & Wilcox, representing the Power Plant Equipment Group

John Matthews, William Cabble Excelsior Wire Manufacturing Company, representing Wires and Felts Manufacturers Group

H. F. R. Webber, Link-Belt Company, representing the Materials of Construction, Maintenance & Supply Group

C. D. DeMers, Taylor Instrument, representing the Control Instrument Manufacturers Group

SOUTHERN ASS'N ADVOCATES FOREST CUTTING CONTROL

A report advocating public control over cutting practices on private forest lands if voluntary effort fails was approved at the seventh annual meeting of the Southern Association of Science and Industry, held May 26-27 in Birmingham, Ala.

"Next to forest fire protection, the future of the Southern forest economy depends on good cutting practices," according to the report, which was drafted by a committee headed by Dr. Clarence F. Korstian, dean of the Duke University School of Forestry.

"Education has been effective in control; it can be just as effective in forest management if sufficient men, funds, ingenuity and effort are used in a program to bring about forest management," the report said.

Pointing out that the South has 195,000,000 acres of forests capable of producing many benefits for the people, the report said that, unfortunately, mismanagement of more than one-half of this acreage keeps this forest land from producing more than one-third of its capacity.

Besides its comment on forest fire protection and improved cutting prac-

Speakers table at Industrial Affiliates dinner meeting

NOW, GREASES THAT RESIST BOTH HEAT AND WATER

STANOLITH
LITHIUM SOAP GREASES

WERE YOU ever faced with the problem of lubricating bearings which operated under extremely wet conditions and, at the same time, were subjected to widely varying temperatures? If so, you probably had to choose between a high-temperature grease with poor resistance to water or a water-resistant lubricant with only fair resistance to heat.

Standard Oil's new Stanolith greases end all need for compromise. A lithium soap grease has unusual characteristics which conventional soda soap or lime soap greases cannot duplicate. Stanolith greases resist the washing action of water because they are insoluble in water and also are extremely adhesive. They resist heat because they are made from an extremely stable base oil and a high-melting point soap, and contain an oxidation inhibitor.

Where you have a heat-and-water problem or where costly machines demand the best possible lubrication, try Stanolith. A Standard Oil Lubrication Engineer will help to make a test. Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Performance Characteristics of Stanolith Greases

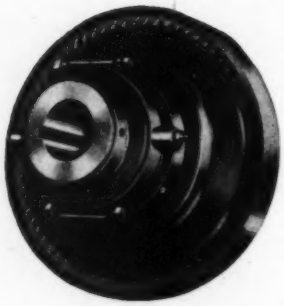
- operate over a wide range of temperatures—have high dropping points.
- have excellent water resistance.
- have unusual mechanical stability—a minimum of oil evaporation and separation.
- contain effective oxidation inhibitors.
- are corrosion resistant.

Two grades of Stanolith Greases are available: No. 42—with a No. 1 consistency, and No. 57—with a No. 2 consistency.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

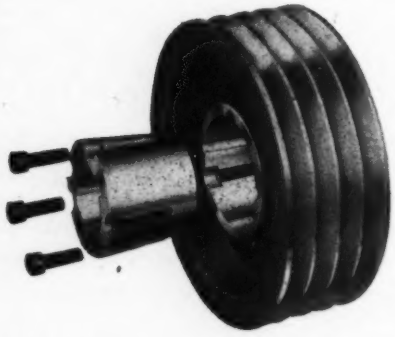
This is the BRONZOIL Bearing. Developed by Dodge for fan and blower service. A new and better transmission appliance.

U. S. Patent No. 1,931,055



This is the ROLLING GRIP Clutch. Developed by Dodge. No toggles. A new and better transmission appliance.

U. S. Patent No. 2,397,414



This is the TAPER-LOCK Sheave. Developed by Dodge. No flange. No collar. A new and better transmission appliance.

U. S. Patent No. 2,402,743

This is the Dodge Transmissioneer – who will tell you about new ways of transmitting power mechanically.

DODGE

of Mishawaka, Ind.

New equipment which helps cut costs, improve machine performance, increase production is offered to you by Dodge of Mishawaka. For detailed information about power transmission units to meet specific needs in your plant, or on your product, call the Transmissioneer, your local Dodge distributor. Look for his name in the classified telephone directory under "Power Transmission Equipment." A talk with him will prove profitable to you.

DODGE MANUFACTURING CORP., MISHAWAKA, IND.

Copyright, 1947, Dodge Mfg. Corp.

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

E. D. JONES & SONS CO. BEGIN SECOND CENTURY

EDITOR'S NOTE: This brief story of E. D. Jones & Sons Company is a digest of a complete historical monograph to be published in the form of a brochure by the company. The work of compiling the monograph was done by Clay Perry, who also has prepared this digest.

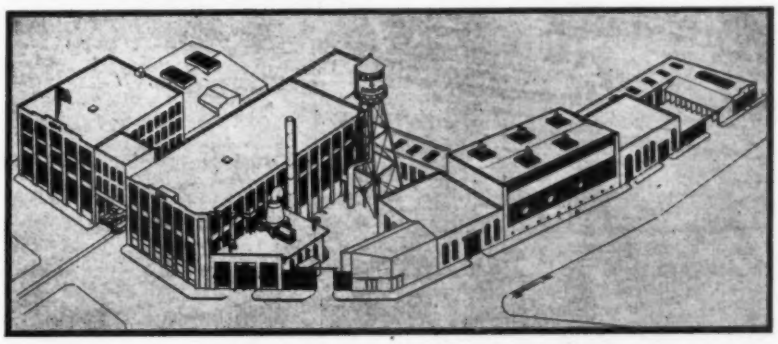
The year 1945 marked the one hundredth anniversary of E. D. Jones & Sons Company of Pittsfield, Massachusetts, manufacturers of papermaking machinery. In April of that same year, S. Harley Jones, grandson of the founder, was elected president of the firm. The day following his election, an item appearing in the *Springfield* (Mass.) *Republican* stated that "The Jones company is said to be one of only six industrial corporations in the United States that have been in continuous operation by the same family for at least 100 years."

Whether that statement is exactly true or not is unimportant. The important thing is that this firm has grown from a little one room shop in a wooden building on one bank of a small brook known as the Greenwater, in the tiny village of East Lee, Massachusetts, to a plant that now occupies a large area in the heart of Pittsfield, a city of over 50,000 population and in the same state. Probably about 90 per cent of the paper mills in the United States today are using machinery of its manufacture. In addition, it has supplied machinery and equipment to mills in Africa, Asia, and Europe.

The beginnings of the firm were most picturesque. It was instituted by a young man, Edward D. G. Jones, when he was just twenty-one. He had gone out into the world from his birthplace in Otis, Massachusetts, learned the trade of wheelwright, and then started in business in Lee, a neighboring village to his birthplace and which for a time somewhat later was the chief papermaking center in the United States.

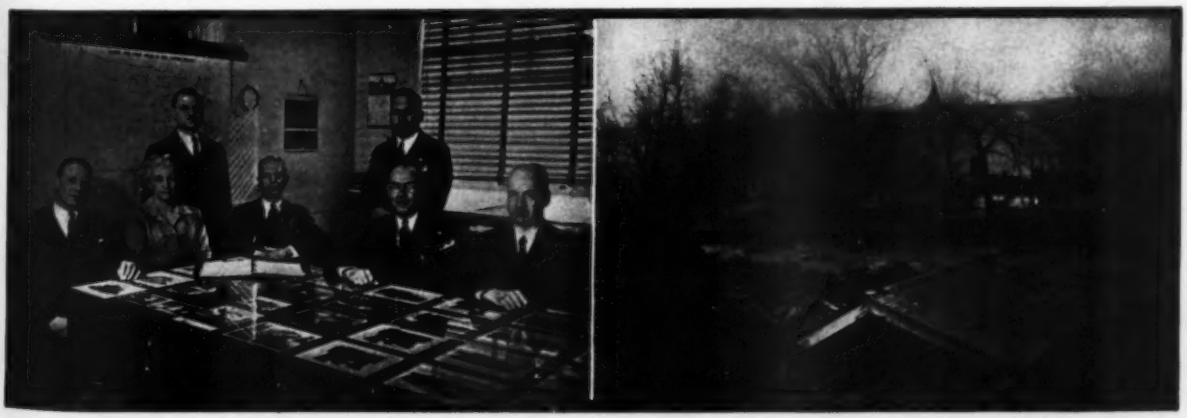
As a boy, he had been taken to Brooklyn by his father who was a jeweler and watchmaker. He received his education there and in Wellington, Ohio, under the tutelage of Timothy Jones, an uncle.

Having become an expert wheelwright, he headed straight for Lee upon reaching his majority and began work in the little one-story wooden shop. The shop was being operated at the time by Bradford M. Couch of a family of famous papermakers. He was manufacturing machinery for the mills of East Lee. Soon the young man bought the shop from Mr. Couch and by 1850, according to local published histories, he had "become famous for his expertness in the manufacture of papermaking machinery."



Artist's sketch of E. D. Jones & Sons Company's plant

There had been a paper mill in Lee since 1806. Over two dozen mills were located there in the 1860's. E. D. G. Jones, however, found the town and its facilities too small for him. In 1866, with Henry C. Clark, he bought out a small shop in Pittsfield



LEFT—Officers of E. D. Jones & Sons Co.; (L to R)—S. Harley Jones, president; Miss Elizabeth Hill, assistant treasurer; Elmer E. Dawson, Jr. (standing), treasurer; Dwight E. Jones, vice president in charge of engineering and production; Stanley P. Benton, chairman of the board; John I. Donna (standing behind Mr. Jones), secretary; Henry H. Williams, executive vice president . . . RIGHT—The roof was all that remained of the original Jones shop after the flood of 1886 (Photo loaned by Major W. H. Weingar)

which had been established in 1844 by Gordan McKay. Here he began a business which within a few years became internationally famous.

In 1916, Edward Boltwood, Pittsfield's able historian, when commenting about the firm, said, "Wider in geographical extent [than other industries] has been the market developed by the E. D. Jones & Sons Company whose machinery is used in many of the industrial centers of Asia, Europe, and North and South America."

The original little shop, where Edward Jones started in business, was ruined in the great East Lee flood of 1886. During the flood, a dam burst and wiped out several of the little industries on the stream.

In 1890, Edward Jones became sole owner of the business in Pittsfield. He bought out Mr. Clark who returned to Lee to become associated with another firm which was making machinery for paper mills. This plant, located on the same small stream as the original shop of Mr. Jones, the Greenwater, with a record of continuous operation since 1828, operates today as the Clark-Aiken Company, Inc.

Soon after becoming sole owner of the business in Pittsfield, Mr. Jones brought his two sons, Harley E. and Edward A., into the firm; and, in 1893, the business was incorporated under the name it now bears. Rather rapid expansion gave the plant a foundry, machine shop, and woodshop. By 1915, the plant literally had "turned a corner" since its properties had grown along the curving McKay Street until they formed almost a half-circle of buildings, some of them up to four stories in height.

Edward D. G. Jones died in 1904 at the age of 80 years, active to the last, and his second son, Edward A., took over, his brother, Harley, having died in 1896.

Another son of Edward D. G. Jones, Ralph, also had joined the firm. Both he and Edward A. died in 1928, leaving a new woodshop, enlarged machine shop and a new foundry, using electricity throughout.

With the passing of Edward A. and Ralph, Stanley P. Benton, a son-in-law of Harley Jones, assumed executive leadership and continued in this capacity from 1928 to 1945 when S. Harley Jones took over. Since that time, Mr. Benton has functioned as chairman of the board.

During World War II, the plant was given over entirely to the manufacture of heavy equipment for the Navy and the Maritime Commission. This equipment included propeller shafts for merchant ships, bearings for destroyer escorts and LSTs, and complicated rammers for the sixteen-inch guns of the Navy.

Electronics engineer, Joe Kovalsky (with blueprint), industrial control division, Westinghouse Electric Corporation, East Pittsburgh, tells District Consulting and Application Engineers how the electronic speed regulator to his right, once set, maintains constant draw between all seven sections of a paper machine. These engineers visited East Pittsburgh to get first-hand knowledge of a new development. One of the inherent features of the electronic regulator is its "split-second" response to changes in load and speed. Left to right—(front row) J. G. Stephenson, Atlanta, Ga.; Fred B. Mead Buffalo, N. Y.; (back row) H. E. Nason, Chicago; M. G. Myers, Boston; and (extreme right) F. N. Bell, Philadelphia

The full capacity of the plant again is given over to the manufacture of papermaking machinery, especially stock preparation equipment, such as beaters, jordans, screens, dusters, pulpers, washers, bleachers, and special equipment in this field.

Some of the old wood tub beaters made by E. D. G. Jones are in use to this day after nearly a century of service. Jones beaters also are being used in the mill, designated as the Government Mill, located in Pittsfield and operated by Crane & Company, in which paper for United States currency and war bonds is made.

The present officers of E. D. Jones & Sons Company are: Chairman of the board, Stanley P. Benton; President, S. Harley Jones; executive vice president, Henry H. Williams; vice president in charge of engineering and production, Dwight E. Jones (member of a branch of the E. D. G. Jones family); treasurer, Elmer E. Dawson, Jr.; assistant treasurer, Miss Elizabeth Hill; and secretary, John I. Donna.

S. Harley Jones, the president, is son of the late Ralph S. Jones. He is 41 years old. After learning the business from the ground up during school vacations, he became attached to the office force in 1929. He created an advertising department for the company in 1933 and entered the sales end of the business, becoming assistant to the general manager in 1936. He was chosen a director of the firm in 1931; was elected vice president in 1938, and entered upon his responsibilities as president in 1945 well-equipped to carry on the tradition of "keep up with the Joneses."

◆

▶▶▶ A PLANT LOCATED near St. Charles, Illinois, and temporarily occupied by the Majestic Radio Corporation, has been purchased from the War Assets Administration by Owens-Illinois Glass Company. The purchase price announced was $778,000. This unit will be devoted to the production of plastics.

◆

▶▶▶ MANUFACTURE of two types of lecithin from soybean oil has been begun by the A. E. Staley Manufacturing Company, Decatur, Illinois. In announcing the mass production of special types of lecithin for industrial uses, the company has pointed out that lecithin has a large field for use in industrial products, such as in the manufacture of paints, tanning of leather and in paper manufacture.

Part of the picture of Famous Products
MEAD papers
"I don't know, mister ... but I'll find out."
NEW PRODUCTS DIVISION
THE MEAD CORPORATION
WALDRON Processing MACHINES

America's versatile paper manufacturer, THE MEAD CORPORATION, is successfully meeting the steady demand for new FUNCTIONAL papers. To produce papers that will solve the growing variety of packaging problems requires unusual paper making experience, painstaking research and ingenious processing machinery for such operations as coating, combining, treating and the like.

The part played by WALDRON MACHINES in the production of MEAD PAPERS affords ample proof of their ability to produce results in keeping with the high quality standards maintained by such leading manufacturers and converters.

Whatever your paper processing problem, investigate the possibilities of using WALDRON Machines like the WALDRON Reverse Roll Coater and Laminator illustrated above, one of many types available. A century and more of machine building experience is at your service.

Coating Machines
Creping Machines
Embossing Machines
Floor Cov. Machines
Gumming Machines
Laminating Machines
Printing Machines
Rubber Mill Machines
Wall Paper Machines
Waxing Machines
Winders and Slitters
Special Design Machines

JOHN WALDRON CORP.

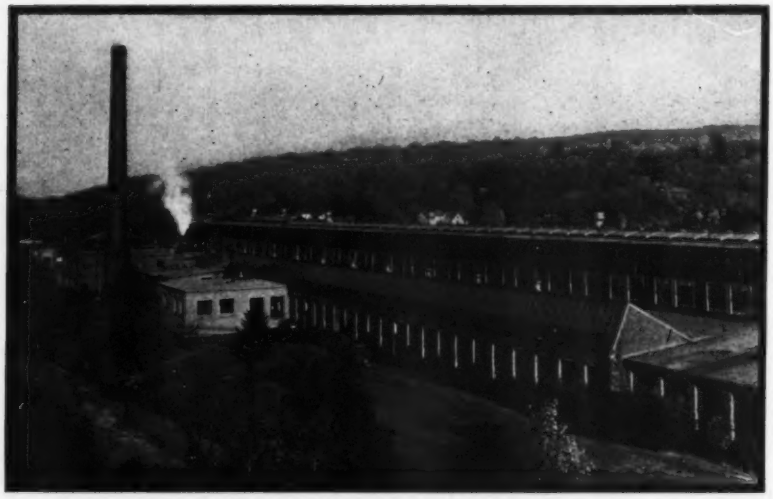
Main Office & Works - NEW BRUNSWICK, NEW JERSEY

CHICAGO - 6
201 N. WELLS ST.

NEW YORK - 17
350 MADISON AVE.

BOSTON - 9
79 MILK ST.

BUILDERS OF QUALITY MACHINES SINCE 1827



Present plant of the Warren Steam Pump Company

WARREN STEAM PUMP CO. MARKS 50TH ANNIVERSARY

Warren, Massachusetts, always has been a "Pump Town" . . . at least for several generations . . . the first pumps manufactured here being of the hand variety back early in the nineteenth century. Steam pumps came in 1859, and from a two-man project was developed the Knowles Steam Pump Works, employing some 400 to 500 hands, afterward to be affiliated with George F. Blake Manufacturing Company of Boston, and removed to East Cambridge, Massachusetts. This left the town minus its main industry and in February, 1897, the Warren Steam Pump Company had its humble beginning, sponsored by former skilled Knowles company workers and a group of influential citizens.

During the first several years, reciprocating pumps were the sole product of the company, and into them went the skill of determined New England craftsmen . . . whose main objective as it is today, was to build the best possible pump. Constant research and development speeded the accomplishment of this purpose and the business prospered, making expansion of plant and facilities necessary as distribution increased. In 1902, the first section of what is now the main machine shop was built. Additions have been made from time to time until this unit is now nearly 700 feet long and contains the most modern facilities for the production of both reciprocating and centrifugal pumps, a complete line of the latter having been added in 1924.

Warren's war effort record was an enviable one, in recognition of which they were awarded the Army-Navy "E." But it has been during peace times that the company's reputation as quality pump builders has been so firmly established, a position gained by the ingenuity and experence of its men and the efficiency of its methods. Today there is hardly a type of industry in which there are not Warren pump installations, either in the power plant or in processing . . . often both. This is particularly true in the pulp and paper industry, a field in which the company has specialized for more than twenty years. John G. Rearick, research engineer, now spends practically all his time in this field, and over a period of years has made many worth-while contributions. The Warren line for pulp and paper mills includes practically all services; also boiler feed and all other power plant requirements.

The company looks back over a century of achievement, determined to make the past serve the future . . . determined to make added experience, increased facilities and greater "know-how" useful in serving the ever widening pulp and paper mill field.

◆

BRITISH SUBSIDIARY OF MONSANTO WILL EXPAND

Plans for the financing of an expansion program by Monsanto Chemicals, Ltd., the British subsidiary of Monsanto Chemical Company, have been announced.

Contracts have been signed with Messrs. Morgan-Grenfell and Lazard Freres for a public offering of 1,500,000 pounds of 3¾ per cent cumulative preference shares, and 600,000 ordinary shares. The preference shares will be sold at 105 per cent of par and the ordinary shares will be sold at approximately $8.50 per share. The net proceeds of both issues will amount to approximately $11,000,000.

About $1,600,000 will be used to redeem 400,000 pounds par value of the 5½ per cent preference shares now outstanding, and the balance will remain in the company's treasury to defray the costs of constructing the British company's new Newport works and other projects of the company. Monsanto Chemical Company, St. Louis, will retain 80 per cent of the ordinary shares.

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▶▶▶ A SLOGAN "Keep 'em moving," has been adopted by a newly formed bureau of the Union Pacific Freight Officials under the direction of G. F. Ashby, president of the railroad. Mr. Ashby states this action is taken with a view of improving the supply of box and other freight cars and to aid shippers. Cars are in short supply now and this condition is bound to get more critical during the summer and fall months when the peak of freight shipments is reached. The new bureau has been established as a part of the Department of the Superintendent of Transportation and is making a study of the question in detail.

◆

NEW JONES PULPING MACHINE WILL BE NAMED IN CONTEST

A new pulping machine has been developed by E. D. Jones & Sons Company, Pittsfield, Massachusetts. This machine has not yet been named; the name given it will be chosen from names submitted in a contest now open to executives, operators or employees of paper mills. This contest closes July 15, 1947, and a cash award of $500 will be awarded the person who sends in the winning name.

Contest data may be obtained from the E. D. Jones & Sons Company.

◆

GRINNELL CO. HAS TAKEN OVER B. HOFFMAN MFG. CO.

The acquisition of the B. Hoffmann Manufacturing Company (Milwaukee, Wisconsin) has been announced by Grinnell Company, Inc. The new branch will be known as a division of Grinnell Company, Inc., and will serve the southern section of Wisconsin.

T. R. Horan

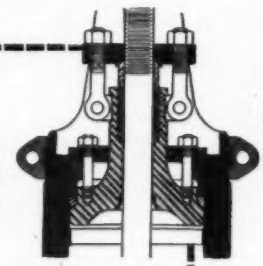
T. R. Horan, associated with the Grinnell Company since 1920, has been appointed branch manager. B. Hoffman, Jr., president of the B. Hoffmann Manufacturing Company will serve as consulting manager of the new branch.

MORE COMPACT!

New CRANE *PRESSURE-SEAL BONNET* VALVES

Note comparative dimensions of 1500-Pound Crane Pressure-Seal Steel Gate Valve and of conventional design. Both are 8-inch. In every size, these new valves give you important space-saving advantages. Require less head-room to operate.

HOW THE LEAK-PROOF PRESSURE-SEAL BONNET JOINT OPERATES



Bonnet joint is inside the valve . . . sealed with wedge-shaped seal ring. Fluid pressure in valve automatically keeps bonnet joint tight. No bolts to retain pressure. Leakage is impossible.

NEW PERFECTION IN VALVE DESIGN FOR HIGH PRESSURES AND HIGH TEMPERATURES

New streamlined, simplified construction . . . inside and out . . . saves 40 to 60% weight over conventional valves. Inspection is easier . . . insulation is simplified. New disc and seating arrangements assure highly improved operating efficiency. As developed by Crane, the Pressure-Seal principle brings a whole new era in valve engineering and valve performance.

The Crane Pressure-Seal line includes gate, globe, angle, and automatic stop-check patterns with welding ends. Complete information regarding performance and adaptability to your requirements supplied on request. No obligation . . . call your Crane Branch.

1500-Pound Crane Pressure-Seal Bonnet Globe Valve.

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

LARGE ATTENDANCE MARKS ROSS ENGINEERING CONF.

More than one hundred of the sales engineers from all United States and Canadian offices and plants of the J. O. Ross Engineering Corporation were present for the firm's annual sales conference held April 14-19 at the Roosevelt Hotel, New York. Sales and engineering developments were discussed at the daily sessions. Many of the new air systems being planned for improved processing operations in major industries, such as pulp and paper, textiles, food, metal-working and others were explained in detail.

The sessions were conducted by President S. W. Fletcher, who referred to the rapid growing expansion of the firm's activities and the exceptional diversification of manufacturing processes in which Ross Air Systems are now being used.

Staff members attended from the firm's offices in New York, Boston, Chicago, Detroit, Los Angeles and Montreal, as well as from the plants maintained at New Brunswick, N. J., and Verdun, Canada.

J. O. Ross, chairman of the board, who had just returned from a trip to Mexico, briefly outlined developments in foreign markets in his reference to the activities of the firm's English affiliate, Carrier - Ross Engineering Company, Ltd., of London.

◆

▶▶▶ NOW UNDER CONSTRUCTION at the Wyandotte (Michigan) plant of Pennsylvania Salt Manufacturing Company is new equipment with additional boilers and allied power generating equipment, including a completely new modern power plant building, at a cost of more than $3,500,000. In addition to new equipment, Pennsalt is installing fly ash collectors for the present three large pulverized-coal burning boilers at an estimated cost of $200,000. Completion is expected during 1948.

◆

CALCO IS HOST TO GROUP ATTENDING CHEMISTS' ASS'N

When members of the Manufacturing Chemists' Association assembled in New York recently for a series of discussions on problems confronting the chemical industry, the group was entertained by Calco Chemical Division of American Cyanamid Company. The guests were taken by chartered bus from New York City to Bound Brook (N. J.) to visit the Calco company's effluent plant.

The visiting group was headed by Dr. R. W. Hess, president of the Association and director of research of the National Aniline Division, Allied Dye & Chemical Corporation. The visitors were conducted through the plant by Dr. Victor L. King, technical director of Calco, Messrs. R. E. Lester, D. Tarvin, M. Van Nostrand, and M. Banks.

Ross engineers in session at sales conference

◆

SUBMERSIBLE SYNCHRONOUS MOTORS FOR C-Z PLANT

Built to withstand submersion during spring floods, six watertight synchronous motors are being supplied the Crown Zellerbach Company's paper mill at West Linn, Oregon, by the General Electric Company.

Each of the 2300-hp. motors will drive three wood-pulp grinders. Submersible motors are required for the job because the grinding mills are located on the bank of the Willamette River, which sometimes rises as much as 40 feet during the spring thaws covering the machinery and halting operation.

The motors are built so that the bearings and bearing pedestals, normally built outside the motor frame on standard motors, are enclosed with the stator and rotor in a specially fabricated framework to protect them during shutdowns.

◆

▶▶▶ THE TRADE NAME "Paracol" will designate Hercules Powder Company's water-dispersible wax emulsions for the paper industry which will be sold in Canada. These products formerly were sold under the name of "Aquapel". Paracols are used extensively in the paper and paperboard industry for improving finish and printability and giving increased flexibility and waterproofing.

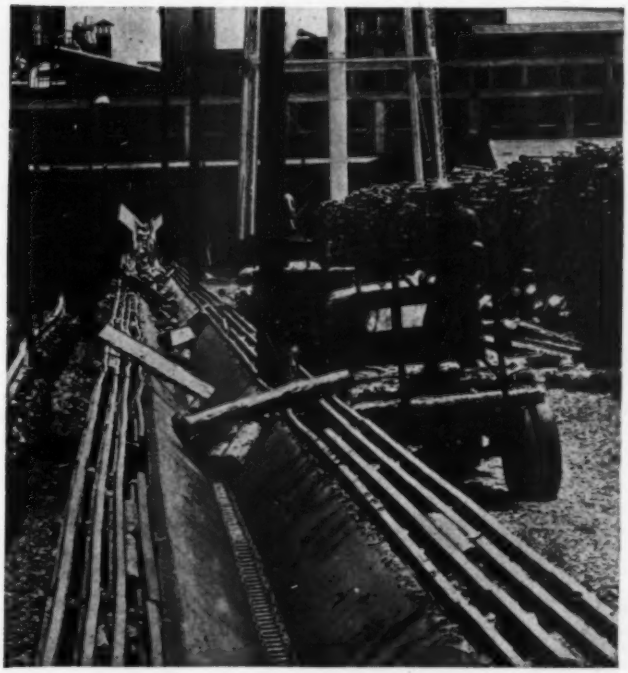
Members of the Manufacturer's Chemists Association visited the effluent plant of the Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J.

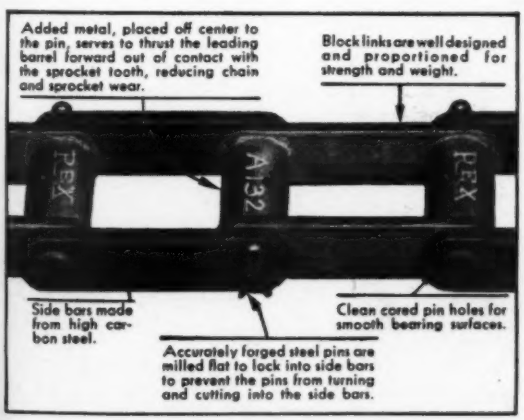
to Short-cut a Log Haul

see the Rex man!

① TO SHORT-CUT YOUR PLANNING for a new log haul conveyor or in modernizing existing installations, consult the Rex Man. He's an expert on pulp mill conveyors . . . can save you time and money in selecting exactly the right equipment for the job.

② THIS MILL, FOR EXAMPLE, took advantage of the application skill of the Rex Man. He helped design this conveyor and specified Rex Z-Metal Durobar chain belt for the job. Operating outdoors, in all types of weather and subjected to the pounding of the logs as they drop on the conveyor, the chain has given excellent service. Maintenance costs have been extremely low.




Added metal, placed off center to the pin, serves to thrust the leading barrel forward out of contact with the sprocket tooth, reducing chain and sprocket wear.
Block links are well designed and proportioned for strength and weight.
REX
A132
REX
Side bars made from high carbon steel.
Clean cored pin holes for smooth bearing surfaces.
Accurately forged steel pins are milled flat to lock into side bars to prevent the pins from turning and cutting into the side bars.

③ THE REX MAN specified Rex Z-Metal Durobar chain for this job because of the severe service conditions. As this close-up shows, Rex Durobar chain has a number of outstanding advantages, and combined with the extra strength and corrosion-resistant abilities of Rex Z-Metal, it was the right chain for the job. Take advantage of the application skill of the Rex Man to get the most from your mill conveyors.

You'll find it pays! Call him or write to Chain Belt Company, 1714 W. Bruce St., Milwaukee 4, Wisconsin.

REX CHAIN BELTS

CHAIN BELT COMPANY of Milwaukee

RYERSON HOLDS OPEN HOUSE AT NEW LOS ANGELES PLANT

About 4,000 persons attended the Open House held May 15 at the Los Angeles plant of Joseph T. Ryerson & Son, Inc. F. A. Purdy, plant manager, and T. L. Kishbaugh, assistant manager, acted as hosts. The new plant has been in operation since October, 1946.

The visitors toured the general offices and warehouses where members of the Ryerson organization were stationed to explain the company's methods. Later, dinner was served in dining cars and in a large, gaily decorated tent which gave the event a holiday-like atmosphere.

The following Ryerson executives were on hand to welcome guests: Everett D. Graff, president; Harold B. Ressler, vice president and general manager of sales; Ainslie Y. Sawyer, vice president; William Seymour, Jr., assistant vice president; and Thomas E. Hayward, assistant general manager of sales.

The Los Angeles plant, twelfth in the Ryerson nation-wide system, is the first to be placed in operation on the West coast. The warehouse building covers an area of some 200,000 square feet and is equipped with the latest and most accurate high speed types of cutting and handling machinery.

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▶▶▶ WITHDRAWAL FROM the firm of Moses H. Teaze is announced by Hardy S. Ferguson and Company, New York City. This change became effective June 1.

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▶▶▶ SCORES OF Canadian printers, bookbinders and others in the Graphic Arts Industry recently attended a demonstration of the new Lawson "38" Paper Cutter in the Toronto showrooms of Sears, Limited. W. J. Hourigan, treasurer of E. P. Lawson Company, Inc., New York, assisted by members of the Sears organization, demonstrated the many new and exclusive features built into the Lawson Cutter to provide added safety, accuracy, speed, and simplicity of adjustment.

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▶▶▶ A REGISTRATION statement filed by the Nopco Chemical Company (formerly National Oil Products Company) with the Securities and Exchange Commission involving the proposed sale of 25,000 shares of new preferred stock, says that newer developments in the industrial products division of the company include production of a range of synthetic resin emulsions prepared by monomer polymerization and co-polymerization.

▶▶▶ THE ACQUISITION OF Electro-Technical Products, Inc., leading manufacturers of bottle cap liners, rubber separator cloth and electrical insulation; with plants in Nutley (N. J.) and Los Angeles, is announced by the Sun Chemical Corporation. This business will operate as a division of the Sun Company, under the direction of Robert S. Robe as president.

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▶▶▶ A NEW ADDRESS for the Chicago office of D. J. Murray Manufacturing Company (Wausau, Wisconsin) has been announced as Room 648, First National Bank Building, 38 South Dearborn Street. The office formerly was located at 43 East Ohio Street.

◆

▶▶▶ NEW REPRESENTATIVE for the complete line of Heathcote knives in the Western Hemisphere (with exception of Brazil) is Vernon H. Greggs, Inc., of 330 N. Charles Street, Baltimore. The manufacturer of this line of knives for many industries, including paper and printing, is A. R. Heathcote Company, Ltd., Sheffield, England.

◆

▶▶▶ THREE- AND FOUR-WEEK vacations will be granted to employees of long periods of service with the Mathieson Alkali Works. More than ⅓ of Mathieson employees will benefit, it was stated, starting with the 1947 vacation period.

◆

▶▶▶ NEW PLANT FACILITIES to increase the production of gummed paper products have been completed for the Brown-Bridge Mill, Inc., at Troy, Ohio, according to The H. K. Ferguson Company, industrial engineers and builders. The new unit consists of a one-story extension to an existing structure, and is already in operation.

◆

HERCULES NOW OPERATING FIRST UNIT OF NEW PLANT

A modern new Hercules Powder Company plant, for the manufacture of chemicals for the paint, varnish, lacquer, adhesives, and other industries, officially was opened in Burlington, New Jersey on April 30.

The first unit of the plant to be brought into production was the one for the manufacture of Pentaerythritol resins for protective coatings. Subsequently, units for the manufacture of liquid resins, rosin esters, and hydroabietyl alcohol, will be in operation. The plant is expected to be in full production the latter part of this summer.

◆

▶▶▶ THROUGH PURCHASE by one of its affiliates, the U. S. Rubber Company has acquired a plant in Chicago owned and formerly occupied by Helene Curtis Industries, Inc. A subsidiary of U. S. Rubber will occupy the plant which will be devoted to the production of plastic products.

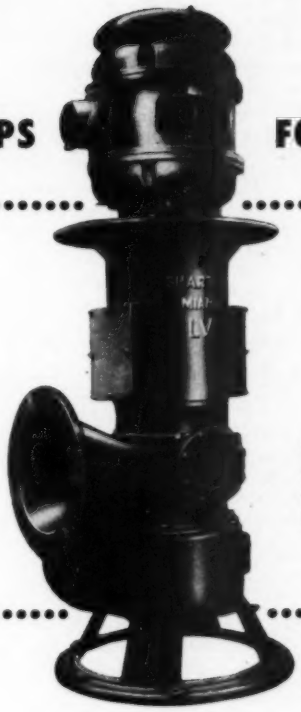
◆

▶▶▶ A NEW LABORATORY was dedicated recently by A. Wilhelm Company, Reading, Pennsylvania, an affiliate of The Glidden Company, Chicago. The new structure contains 15 large rooms, including 12 separate laboratory rooms. The new Reading laboratory is one of the main co-ordinating laboratories of the Paint & Varnish Division's research program of which Edward Schulte is technical director, with headquarters in Cleveland.

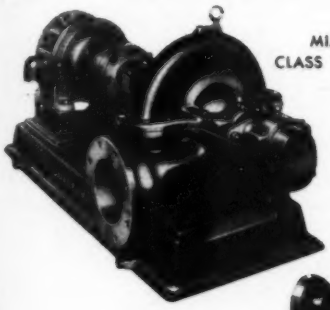
Lawson paper cutter demonstrated at Sears, Ltd., Toronto

YOU CAN'T GUESS-BUILD PUMPS FOR PAPER MILLS

There is no such thing as "guess-building" a pump to handle paper stock. You have to study the action of the stock at various densities, at each and every step in the preparatory process. You've got to go into the mills to do it—exactly what Shartle engineers have long been doing. That's why Miami pumps carry the design they do, why they do such effective work, why they are so widely used.



MIAMI CLASS "LV" PUMP to agitate stock in the chests. Also specially adapted to pumping low consistencies.



MIAMI
CLASS "A" PUMP

MIAMI
CLASS "HM" PUMP

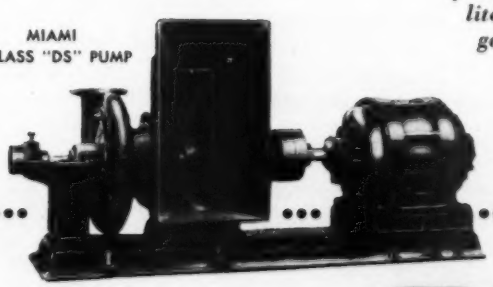
The Miami pump line is a big line and long study of mill conditions influenced every design on it.

MIAMI CLASS "A" to replace old fan pumps. Built special to pump water or thin stock. Double suction. 16 sizes. Capacities 100 to 10,000 g.p.m. With a Miami Class "A" a higher test sheet on lower consistency at the vats becomes practical.

●

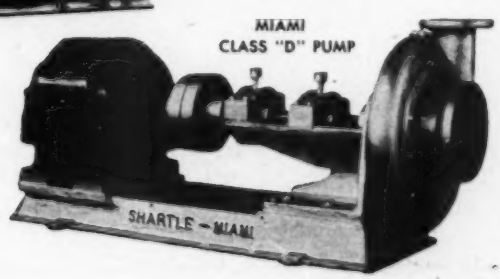
These and several other specialized pumps fully described in available literature. Just state the need and get the Shartle recommendation.

MIAMI
CLASS "DS" PUMP



Dilts

MIAMI
CLASS "D" PUMP



SHARTLE BROS. MACHINE CO.

MIDDLETOWN, OHIO

DILTS MACHINE WORKS, FULTON, NEW YORK
Divisions of
THE BLACK-CLAWSON CO., Hamilton, Ohio

S A F E T Y

UNION BAG & PAPER CORP. ACTS AS HOST TO ANNUAL SOUTHERN SAFETY ASS'N

The annual meeting of the Southern Pulp and Paper Safety Association was held April 21-22 at Savannah, Georgia. The Union Bag and Paper Corporation was host to the meeting which was attended by safety representatives from 36 pulp and paper companies in 12 of the southern states.

In 1946, this association held its annual meeting in North Carolina; one day at Pisgah Forest with Ecusta Paper Corporation, the second day at Canton with Champion Paper and Fibre Company as host.

◆

TWO EMPLOYEES OF BROWN CO. GIVEN SAFETY AWARDS

Individual awards for "outstanding contributions to the company's safety program," have been presented to two employees of the Brown Company, Berlin, New Hampshire.

Delphis Aube was cited for the design, improvement, and installation of special guards on machinery and in personal protective equipment. He is a millwright at the Cascade mill.

Dana Noyes, who has been a foreman in wood production for 18 years, placed his crew in top position in safety, production, and low labor turnover.

Each of the two men received a personal letter from President Frederic G. Coburn together with a check.

◆

▶▶▶ THE ANNUAL CONGRESS and exposition of the National Safety Council will be held October 6 to 10, at the Stevens Hotel, Chicago. This marks the thirty-fifth such congress to be held by the NSC.

◆

SAFETY SCORES

▶▶▶ FOURTEEN CONTESTANTS in The Paper Industry Safety Contest for 1946-1947 finished the ninth month (March) of the contest with perfect scores. Although March rates increased 2 per cent over the rates for February, the increase did not affect the cumulative rate, and it remains 11 per cent below the rate for the previous contest. The following companies finished March with perfect scores:

Division I—Pulp and Paper Mills

Group A
(None.)

Group B
(None.)

Group C
Certain-teed Products Corp., E. St. Louis, Ill.
Certain-teed Products Corp., York, Pa.

Group D
Stratmore Paper Co. (Woronoco Mill No. 1), West Springfield, Mass.
E. I. du Pont de Nemours & Co., Inc. (Russell Plant), Huntington, Mass.
Certain-teed Products Corp., Buffalo, N. Y.
International Paper Co., Riley, Maine.

Division II—Paper & Board Remanufacturing

Group A
(None.)

Group B
Kimberly-Clark Corp., Memphis, Tenn.
Old Colony Envelope Co., Westfield, Mass.
Bird & Son, Inc. (Roofing Plant), Shreveport, La.
Fort Wayne Corrugated Paper Co. (Rochester Div.), Rochester, N. Y.
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
The Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Cal.
Gaylord Container Corp., Milwaukee, Wis.
Bay West Paper Co., Green Bay, Wis.

"Undoubtedly the services rendered by the National Safety Council have been, in part at least, responsible for the improved safety record our mills have enjoyed in more recent years, even to the winning of first National Honors in our classification."

George E. Williamson, *President*
Strathmore Paper Company
Premold Products, Incorporated
Agawam Chemical, Incorporated

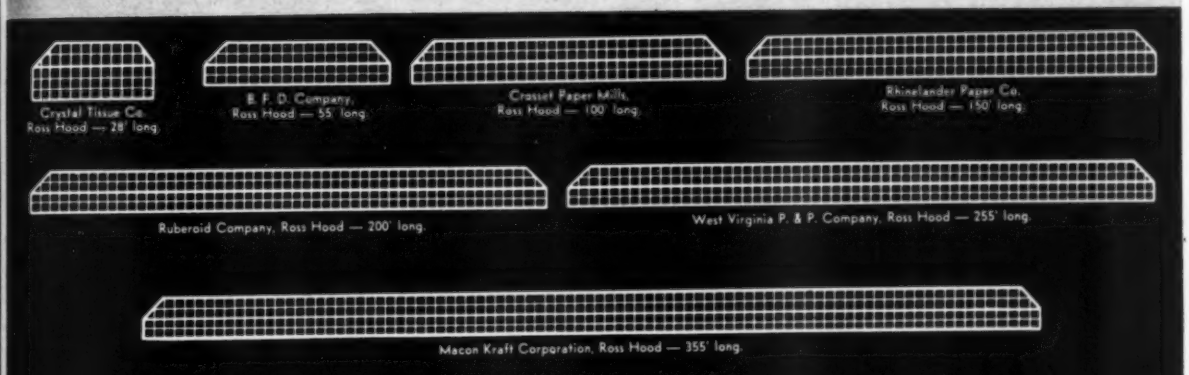
It costs a great deal more to *tolerate* accidents than to *prevent* them. The 290 members of the Council's Paper and Pulp Section will vouch for that statement!

Would you like to know how this non-profit cooperative association can help you cut accident costs and improve your employee and public relations? Then write today for full information.

NATIONAL SAFETY COUNCIL 20 N. Wacker Drive Chicago 6, Illinois

from the smallest to the largest.....

MACHINE HOODS ARE ROSS HOODS


Crystal Tissue Co.
Ross Hood — 28' long.
B. F. D. Company,
Ross Hood — 55' long.
Crossett Paper Mills,
Ross Hood — 100' long.
Rhinelander Paper Co.
Ross Hood — 150' long.
Ruberoid Company, Ross Hood — 200' long.
West Virginia P. & P. Company, Ross Hood — 255' long.
Macon Kraft Corporation, Ross Hood — 355' long.

more than 400 paper machines are equipped with Ross Hoods from 28′ to 355′ in length!

Regardless of its size or type the well dressed paper machine wears a modern ROSS HOOD. Their advance design and construction insure definite operating advantages and economies sufficiently important to make ROSS HOODS practically standard equipment for paper machines. They are built for regular, vertical or Yankee Dryers and avoid any interference with normal machine operation. Our Bulletin No. 17 gives complete details. A copy is yours for the asking.

ROSS SYSTEMS

J. O. ROSS ENGINEERING CORP.

DESIGNERS AND BUILDERS OF AIR PROCESSING SYSTEMS

350 MADISON AVE., NEW YORK 17, N. Y.

ROSS CONTROL OF AIR FOR MODERN INDUSTRY SYSTEMS

201 N. Wells St., Chicago-6 • 79 Milk St., Boston-9 • 12953 Greeley Ave., Detroit-3 • 1709 W. Eighth St., Los Angeles-14

ROSS ENGINEERING OF CANADA, LIMITED — Dominion Square Building, MONTREAL, P. Q.

CARRIER—ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

NAMES in the News

PERSONALS

FRED MAY ELECTED PRES. OF RISING PAPER COMPANY

Associated with the Rising Paper Company of Housatonic, Massachusetts, for the past 18 years, Fred E. May has been elected by the board of directors to succeed the late Richard H. Dempsey as president and general manager (Cf. P. I. and P. W. May, 1947).

Mr. May was graduated from the Troy Conference Academy in Poultney, Vermont., which was also the alma mater of Horace A. Moses, late chairman of the boards of the Rising Paper Company and the Strathmore Paper Company. After leaving school, he went to work in the office of the superintendent of the Woronoco mill of Strathmore. He became superintendent of that mill in 1918. He was in charge of sales promotion for Strathmore in West Springfield in 1926, and in 1929 he was transferred to the sales department of the Rising Paper Company. He became sales manager in 1930 and was elected vice president in 1933.

◆

PROMOTIONS AT POWELL RIVER

Three senior officials have been promoted by Powell River Paper Company, Ltd., Vancouver, British Columbia.

D. A. Evans, resident-manager, has been named vice president in charge of industrial and public relations.

Russell M. Cooper, assistant resident-manager, becomes resident manager.

J. A. Kyles has been appointed comptroller, succeeding J. N. Turvey, who has retired.

Prof. E. Liersch, head of the Forestry Department of the University of British Columbia, has been named forest engineer.

Mr. Evans has been associated with logging and mill operations in Canada for the past thirty years. He has been resident manager at Powell River since 1936. Mr. Cooper began with Powell River as general manager in 1941. Prior to that he was general superintendent of the Ontario Paper Company's plant at Baie Comeau. He became assistant resident manager in 1946. Professor Liersch has had extensive academic experience in forestry as well as close association with the practical end of the logging business.

Left to right—D. A. Evans, Russell M. Cooper, and J. A. Kyles

◆

▶▶▶ An indefinite leave of absence has been granted to *Thomas W. Harrington*, sales manager of the Crocker-McElwain Company (Holyoke, Mass.). Thus he continues his unbroken 42-year record of service to the paper trade since 1905, when he joined the firm. *Edson S. Dunbar* has been appointed as sales manager, having been with the company since 1918 serving as advertising manager and sales promotion manager.

◆

▶▶▶ A new addition to the staff of the development department of Monsanto Chemical Company is *Richard M. Lawrence*, who will specialize in market research work. Mr. Lawrence was formerly with the Chemical Division of the United States Tariff Commission prior to his appointment at Monsanto. He is a principal author of a forthcoming book on market research, which is now appearing in serial form in *Chemical Industries* magazine. Mr. Lawrence is a charter member and has been an officer of the Chemical Market Research Association.

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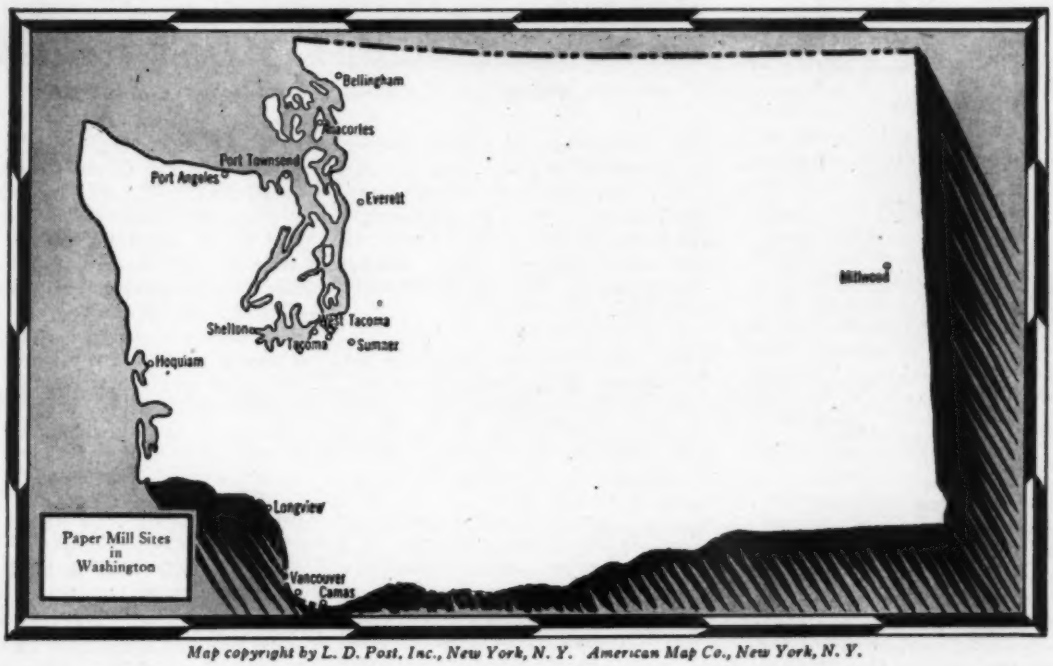
▶▶▶ The John Waldron Corporation, of New Brunswick, New Jersey, has announced the appointment of *Thomas H. Latimer* as executive engineer in charge of engineering, drafting, and estimating. Prior to assuming this new position, Mr. Latimer was chief engineer of the Black Clawson Company (Hamilton, Ohio), and has been connected with the Rice Barton Corporation, Minton Vacuum Dryer Corporation, and the Jessup & Moore Paper Company. He is a brother of *Homer H. Latimer*, of the Champion Paper & Fibre Company.

Thomas H. Latimer

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 30 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



Map copyright by L. D. Post, Inc., New York, N. Y. American Map Co., New York, N. Y.

HIGHLIGHTS: Washington, tenth ranking State in paper production, leads the Pacific States with a yearly tonnage exceeding 600,000 tons of paper and paperboard. In the production of wood pulps it stands second in our nation, with an annual production in excess of 900,000 tons. Twenty-five years ago it produced scarcely more than one-tenth of this amount.

Washington's paper products cover a wide variety — from tissues to book, bond, wrapping paper and boxboard. Fourdriniers, Cylinder and Yankee machines are all in use. Including those employed in pulp manufacture, there are 30 Fourdriniers, 10 cylinders and 3 Yankees. Pulp digestors include 6 sulphite, 32 sulphate, 20 soda; and for making groundwood pulp 60 grinders are in use.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST, PITTSFIELD, MASS. — WILLIAM N. CONNOR, Jr., CANTON, MASS. — L. H. BREYFOGLE, KALAMAZOO, MICH. — WALLEN A. SALMONSON, 519-20 WHITE BLDG., SEATTLE, WASH. — L. L. GRIFFITHS, Jr., KALAMAZOO, MICH.

RAYMOND F. EVANS NEW PRES. DIAMOND ALKALI

Raymond F. Evans has been elected president of Diamond Alkali Company of Pittsburgh, to succeed John T. Richards who has announced his retirement as president and chairman of the board. In retiring at 59, Mr. Richards concludes a 30-year record with the company. He joined Diamond in 1917 as a clerk and rose gradually through the ranks to become its president in 1937 and chairman of the board in 1943.

His successor, Mr. Evans, joined Diamond in 1931 after leaving Princeton. He began his career at the company's Painesville (Ohio) plant and for five years gathered experience in operational jobs.

The election of John A. Sargent as vice president of finance is also announced. Formerly Mr. Sargent was treasurer, a job he had held since coming to Diamond in 1946.

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▶▶▶ A re-election of *Fred C. Boyce* to president of the D. J. Murray Manufacturing Company, Wausau, Wisconsin, has been announced. Elected also were: *M. P. McCullough,* vice president; *C. E. Staky,* as executive vice president and general manager; *A. W. Plier,* secretary and assistant general manager; and *J. S. Alexander,* treasurer.

◆

TWO VICE PRESIDENTS OF NAT'L STARCH PRODS. ARE GIVEN 45-YR. PINS

Recognition of almost a half-century of service with National Starch Products, Inc., and its predecessor company was given to Elias D. Cohen and N. A. McManus, vice presidents of the firm, when Frank K. Greenwall, National's president, presented them with 45-year pins at a staff meeting of the concern in New York.

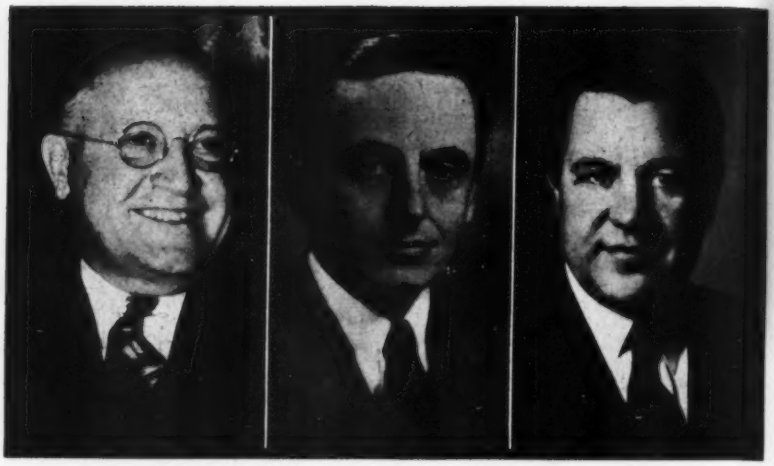
Mr. Cohen and Mr. McManus joined the business in 1902, then known as the National Gum and Mica Company, and have become widely known throughout the country in the adhesives field.

◆

▶▶▶ *Robert S. Aries,* director of the Northeastern Wood Utilization Council, New Haven, Connecticut is leaving for Europe this month to investigate wood using and pulp mills on the continent. Dr. Aries expects to spend most of his time in France, Belgium, and Switzerland studying recent advances in their wood-chemical and allied industries.

◆

▶▶▶ Elections at the American Brake Shoe Company (New York) include *Kempton Dunn* as secretary and *Cyrus E. Brush* as his assistant. *Sumner T. McCall,* vice president and secretary, retires from active service on June 1.



Left to right—J. T. Richards, R. F. Evans, and J. A. Sargent

▶▶▶ As engineering and sales representative of the Liquid Conditioning Corporation's (Linden, New Jersey) Philadelphia district, *William A. Krebs* will handle the sales of Liquon equipment for all water treatment and liquid conditioning processes and Liquonex zeolites of all types. He has had extensive experience as service engineer in the problems of water treatment for power stations and industrial plants in the territory, and is a member of the National Association of Power Engineers.

◆

CONSOLIDATED PAPER CORP. MAKES RICHARD COLLINS A VICE PRES.

Richard Collins has been appointed vice president in charge of manufacturing of the Consolidated Paper Corporation. Mr. Collins, who was born in Bury, England, was educated at the Bury School of Technology and received his early training with Bentley & Jackson, a British firm of paper making engineers. In 1911, he came to Canada on loan to the Wayagamack Pulp and Paper Company and when Consolidated Paper Corporation was formed in 1932, he became manager of the Wayagamack Division; in 1945 he was appointed manager of manufacturing of Consolidated Paper Corporation. Mr. Collins is a member of the Canadian Pulp and Paper Association and of the Technical Association of the Pulp and Paper Industry.

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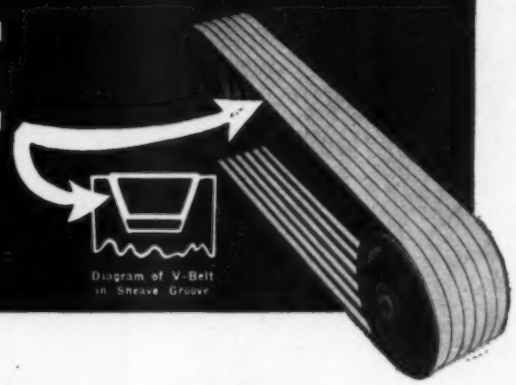
▶▶▶ The appointment of *Walter M. Reynolds* as controller of both the Ithaca, N. Y., and Detroit plants of Morse Chain Company has been announced. He will be in charge of all accounting records and the preparation and interpretation of all financial statements and reports of the company.

Frank K. Greenwall (center), president National Starch Products, Inc. presents to N. A. McManus (left) and Elias D. Cohen (right) 45-year service pins. Both of the men honored are company vice presidents

ONLY the SIDE of a V-BELT *Grips the Pulley!*



—That's why the SIDE is what really *Gets the WEAR!*

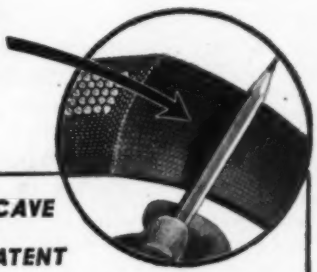
Look at a V-Belt in its sheave and you see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

Notice, too—it's the *sides* that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole.*

And then, once more, its the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

—*and here is how the* CONCAVE SIDE ★REDUCES Sidewall WEAR Giving You Much Longer Belt Life!



Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt. The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

★*More Important NOW That STRONGER Tension Members are Used!*

Now that Gates *Specialized* Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today that ever before!

The CONCAVE SIDE is a GATES PATENT

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley.

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt.

476

THE GATES RUBBER COMPANY, DENVER, U. S. A.
"World's Largest Maker of V-Belts"

GATES VULCO ROPE DRIVES
Engineering Offices IN ALL INDUSTRIAL CENTERS of the U. S. and

Gates
THE MARK OF SPECIALIZED RESEARCH

NEW OFFICERS ELECTED BY THE UPSON COMPANY

Election of Charles A. Upson, former president, as chairman of the board of The Upson Company (Lockport, N. Y.), and of W. Harrison Upson, former executive vice president and treasurer, to the presidency of the company, has been announced by the board of directors. Henry W. Schmidt, who has been secretary, was named secretary-treasurer.

As board chairman, C. A. Upson will continue to take an active part in company affairs and, relieved of management details, will have more time to devote to research, counsel, and the formation of over-all company policies.

◆

▶▶▶ Among recent appointments to positions with the Brown Company (Berlin, N. H.) are the following: *H. B. Reilly,* formerly with The Champion Paper and Fiber Company, Pasadena, Texas, becomes chemical engineer in the pulp division; *Frederick C. Stakel* has become advertising and sales promotion manager; *Lawrence E. Wallace* has accepted the position of tubular salesman and sales manager.

◆

ST. REGIS ANNOUNCES NEW KALAMAZOO APPOINTMENTS

Announced by the St. Regis Paper Company is the appointment of Melvin J. Killian as technical director of its Kalamazoo, Michigan, mill. Mr. Killian formerly was control supervisor and pulp mill superintendent for the Combined Locks Paper Company with which he was associated for ten years.

Another appointment of the same mill is Richard H. Peeters as calender superintendent. Mr. Peeters has had 37 years of experience in the calender field with Combined Locks Paper Company and the Kimberly-Clark Corporation.

Charles A. Upson

W. Harrison Upson, Jr.

◆

▶▶▶ With over nineteen years of experience in the export field, *Homer Parsons* has been appointed director of exports for the American Brake Shoe Company of New York. He formerly served as assistant director of exports.

◆

▶▶▶ Former vice president and technical director of Monsanto Chemical Company, *Charles Allen Thomas,* was elected executive vice president at a recent meeting of the company's board of directors. Concurrently, *Felix N. Williams,* vice president and general manager of the company's plastics division, was elected to the board of directors, *C. A. Hochwalt,* former director of the Central Research Department; *William W. Schneider,* former secretary of the company and head of the legal department; *Daniel M. Sheehan,* former comptroller; and *C. A. Wolfe,* former director of purchases and traffic were all elected as vice presidents.

◆

VINCENT CALISE NOW WITH LIQUID CONDITIONING CORP.

Liquid Conditioning Corporation of Linden, New Jersey, announces that Vincent J. Calise has joined their organization in the capacity of technical manager.

Mr. Calise has long been associated with the development and production of ion exchange materials and the practical application of such materials in zeolite water softeners and other types of cation and anion exchange equipment. His varied and extensive experience as chemical engineer specializing in the field of liquid conditioning has also included the design, construction and operation of all types of water treating equipment.

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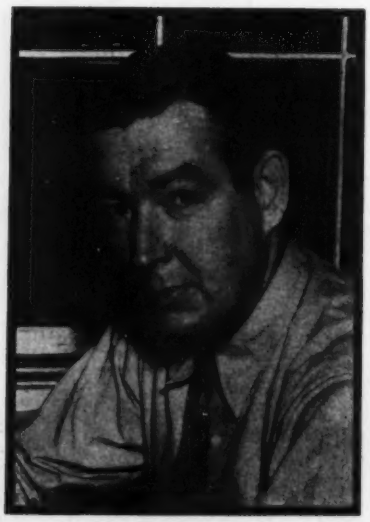
▶▶▶ For many years the head of the statistical department of the West Virginia Pulp and Paper Company, *William L. Merrilees* was elected as assistant secretary at a recent meeting of the board of directors.

◆

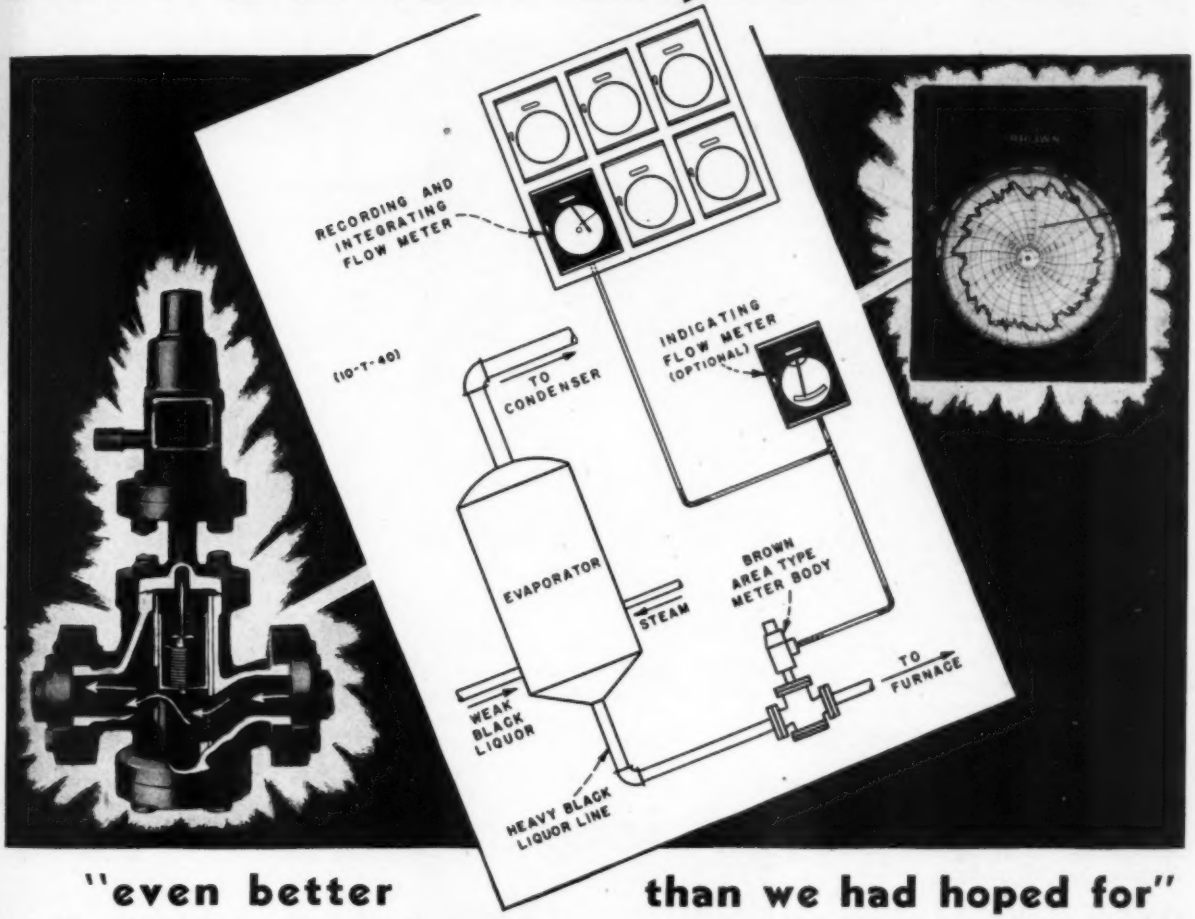
▶▶▶ Appointment of *Karl S. Kramer* as assistant manager of the general purpose turbine section and *John C. Spahr* as assistant manager of the industrial turbine section of the Westinghouse Steam Division, Pittsburgh, was announced recently.



Melvin J. Killian

Richard H. Peeters

FOR BLACK LIQUOR FLOW



"even better than we had hoped for"

In the soda or sulfate process of pulp manufacture, black liquor flow measurement is important. It is the key to measuring the efficiency of recovery operations.

Until the Brown AREA TYPE Flow Meter was developed for this application, there was no really satisfactory method of measuring black liquor flow. Other types of flow meters were inaccurate, they clogged and required almost constant maintenance.

The Brown AREA TYPE Flow Meter eliminates all these problems. Recently at one major paper mill, the meter was completely examined AFTER ALMOST A YEAR AND A HALF OF CONTINUOUS OPERATION . . . and found to be as good as the day it was installed. One executive said, "Performance is even better than we had hoped for."

The Brown AREA TYPE Flow Meter fits in your line like a valve. No external piping is required. The recording instrument (and indicator, if desired) can be located at any remote point because it is connected to the meter body by a simple three-conductor wire circuit. The recorder makes a record of rate of flow and it totalizes flow.

Find out more about this instrument which has proven so valuable to other paper mill operators. Further information on the Brown AREA METER for Black Liquor Flow will be sent to you without obligation. Write today.

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DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.

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BROWN AREA FLOW METER

on the Inductance Bridge Principle

▶▶▶ The new manager of the Los Angeles office of the J. O. Ross Engineering Corporation is *Richard W. Morsch,* who for the past ten years made his headquarters at the New York offices of the firm. He succeeds *W. A. Schoenbeck* who is returning to the New York office. With headquarters in Los Angeles, Mr. Morsch will direct all sales and engineering in connection with the firm's varied line of air processing systems in the Pacific coast territory.

◆

▶▶▶ Well known for many years on the west coast as manager of the Gardner-Denver Company branch office in Los Angeles, *A. H. Jones* has been assigned a director of the export office in New York City. Mr. Jones was also elected vice president of the newly formed Gardner-Denver Hemisphere Company with offices in New York.

◆

CARTER, RICE ADDS FOUR NEW MEN TO SALES STAFF

The addition of four new members to the Carter, Rice & Company Corporation sales staff in Providence (R. I.) has been announced. The four men: Ray S. Allen, Nicholas Pagnao, Wm. M. Keough, Jr., and Howard D. Wilcox, Jr.

The expansion of Carter, Rice sales force in Providence follows closely the company's affiliation with Bulkley, Dunton & Company, Inc. The two merged concerns have offices in New England, located at Boston, Worcester, Springfield, Providence, New Haven, Augusta, and Montpelier.

◆

▶▶▶ The president of the American Supply & Machinery Manufacturers Association is *Walter H. Gebhart,* elected May 14 at the organization's 37th annual convention held in Philadelphia. Mr. Gebhart, first vice president of Henry Disston & Sons, Inc., succeeds *Theodore F. Smith,* president of Oliver Iron & Steel Company, Pittsburgh.

◆

▶▶▶ The board of directors of the Babcock & Wilcox Company has elected *Anthony M. Kobler,* general manager of the refractories division, and *Alan E. Phin,* comptroller, to the office of vice president of the company.

◆

▶▶▶ *Budd E. Simonton* has been appointed manager of the Oswego (N. Y.) Multiwall Paper Bag Plant of the St. Regis Paper Company, according to an announcement. Mr. Simonton succeeds *Theron Contryman,* who held the position for 18 years.

PROMOTIONS ARE GIVEN TO WILLIAMS AND VICKERY BY E. D. JONES & SONS CO.

The appointment of Henry H. Williams as executive vice president and Charles H. Vickery as sales manager

Henry H. Williams

was announced by S. H. Jones, president of E. D. Jones & Sons Company, Pittsfield, Massachusetts.

Mr. Williams became associated with E. D. Jones & Sons Company in 1910. Twenty years later, he entered sales work. He was named assistant treasurer in 1928 and served in that capac-

Charles H. Vickery

ity until 1938 when he was appointed vice president in charge of sales. He has been a director of the company for 15 years.

Mr. Vickery has served as sales engineer for the past eight years.

▶▶▶ On a trip abroad that will cover a period of about two months, *J. A. Elton,* export division manager of the Brown Company (Berlin, N. H.), will visit England, Scotland, France, Holland, Belgium, Switzerland, and Italy, where he will contact agents of the company and many of the principal users of Brown Company products.

◆

▶▶▶ Taking over as manager of the Mason-Neilan San Francisco office is *John W. Brown.* With the company since 1945, he spent a year in the engineering department, then became sales engineer in its Pittsburgh office.

◆

THOS. COYLE RETIRES FROM DUPONT AFTER 40 YEARS IN CHEMICAL IND.

The retirement of Thomas Coyle, manager of the Du Pont company's Chlorine Products Division, has been announced as of May 31. Mr. Coyle had been associated with the chemical industry for more than 40 years.

The Du Pont company has announced that the Chlorine Products Division and Solvents Division will be merged into the Chlorine Products Division, headed by C. B. Shepherd, now manager of the Solvents Division.

◆

▶▶▶ Former electrical and turbine supervisor of the Longview Fibre Company (Longview, Wash.), *John Schuh* has been named inspector of engineering design and plans. Succeeding Mr. Schuh will be *F. M. Peyton.* Other advancements include *Virgil Peters* to the post of mechanical superintendent and *Dade Russell* to that of designing engineer.

◆

▶▶▶ The Link-Belt Company (Chicago) announces *C. R. Heller* as the head of its re-established sales office in Washington, D. C. Mr. Heller's duties will be confined to work with Foreign Purchasing Commissions and with the Governmental and Armed Service Bureaus located in Washington.

◆

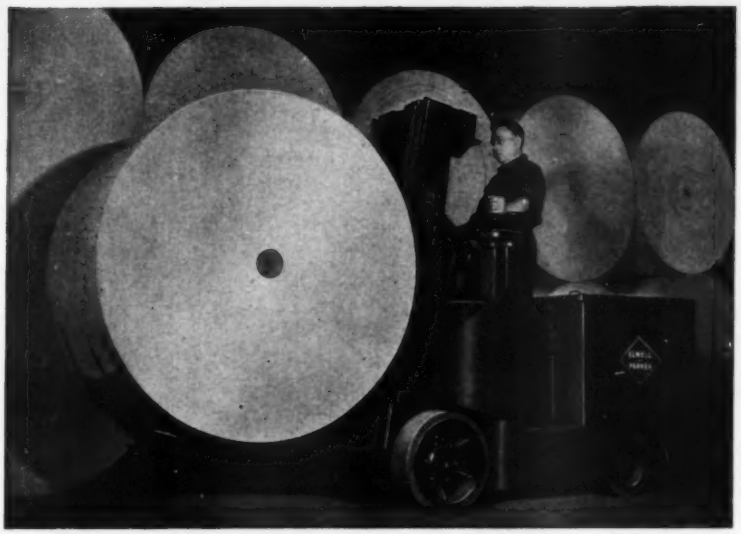
▶▶▶ The resignation of *Archie J. Hayes* as superintendent of the Nekoosa mill of Nekoosa-Edwards Paper Company, became effective on May 1. He had been superintendent of the Nekoosa mill for 15 years.

◆

▶▶▶ The United Paperboard Company, Inc., has appointed *Melvin Wagner* to head its newly created research and development division. He will supervise United's program in developing protective packages for foods and other perishable products.

SUPER STRENGTH

Another Reason Why
ELWELL-PARKERS are preferred!



THE "tank-tough" construction that characterizes Elwell-Parker trucks, tractors and cranes pays off in longer life and minimum maintenance costs. Here are a few reasons why so many Elwell-Parkers are "still going strong" after 20 years of service:

MODERN MATERIALS, PROPERLY PROCESSED—Elwell-Parker makes generous use of alloy steels — chrome, molybdenum and nickel — wherever greater wear is encountered. On vital parts, drop forgings are used more extensively than in the average truck. E-P heat treating is thorough—often involving double or triple firing.

EXTRA RUGGED FRAMES—They have the true ring of one solid piece because they are durably welded and riveted into a unit of heavy gauge plate by Elwell-Parker craftsmen.

STRONGER MOTORS—They are E-P built, Class B type, practically indestructible and fire proof. Because these motors have more copper, greater commutator area, plus more brushes than usual, they easily absorb all the power that can be delivered to them.

UNIQUE ENGINEERING—Because Elwell-Parker engineers have had longer experience, they fully recognize the abuse and overload factor. Consequently, you find *surplus* strength wherever needed; for example: double stabilizing tilt racks, overrunning slip clutches, no fuses, and a new, high-speed travel controller.

For further evidence regarding the strength of these trucks, plus their proper application to your specific needs, call in the nearest E-P man. The Elwell-Parker Electric Co., 4241 St. Clair Avenue, Cleveland 14, Ohio.

ELWELL-PARKER
Established 1893
POWER INDUSTRIAL TRUCKS

▶▶▶ A release from Monsanto Chemical Company (St. Louis) announces that *Daniel S. Dinsmoor,* vice president of Monsanto Chemical Company and general manager of the company's Merrimac Division, has submitted his resignation, to enter the chemical consulting profession. Succeeding Mr. Dinsmoor as general manager of the division is *Josiah B. Rutter,* now director of the general engineering department. Mr. Rutter, in turn, is succeeded by *Fred G. Gronemeyer,* the former assistant director of the general engineering department.

◆

▶▶▶ President S. *Horace Disston* of Henry Disston & Sons, Inc. (Philadelphia), has been advanced to chairman of the board. His successor, *Jacob S. Disston, Jr.,* has been vice president of the company for 14 years.

◆

▶▶▶ For the sixth term, *Walter Geist* was elected to the presidency of the Allis-Chalmers Manufacturing Company, Milwaukee. All other officers and directors also were re-elected.

◆

HUGH C. MINTON MADE PROD'N MGR. OF KOPPERS

New production manager of the Koppers Company, Inc., Pittsburgh, will be Brig. Gen. Hugh C. Minton, who was awarded the Distinguished Service Medal for his outstanding record in the Army Service Forces' Production Division during World War II.

In his new position, General Minton will report directly to General Brehon Somervell, president of Koppers, thereby re-establishing in civilian life a relationship set up in wartime when General Somervell was Commanding General of the Army Service Forces.

◆

HARVEY BROWNELL BECOMES V. P. OF BULKLEY, DUNTON

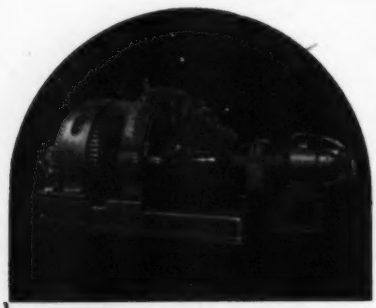
The office of vice president of Bulkley, Dunton & Company, Inc., has been given to Harvey A. Brownell. Mr. Brownell has been in charge of the social stationery and greeting card papers since joining the organization in 1939. Continuing this activity he will also supervise the display paper division.

Harvey A. Brownell

Mr. Brownell's appointment coincides with his 25th anniversary in the paper business. His career began with Eaton, Crane & Pike Company of Pittsfield, Massachusetts, in 1922, where he received his training in stationery converting. In 1925 he entered the paper merchandising field with Carter, Rice & Co. of Boston.

◆

▶▶▶ Appointed recently as the assistant director of research for the Monsanto Chemical Company's Merrimac Division was *Ivan V. Wilson.* Connected with the sales and development departments of the division since 1927, Mr. Wilson will be in charge of all research and application work connected with the development of new and improved types of coatings.



BACK AGAIN...!

CHICAGO ELECTRIC'S monthly Bulletin . . . listing of new and nearly new units for prompt delivery . . . again you can answer procurement problems with Chicago Electric Bulletins, write for your copy *TODAY* . . . !!

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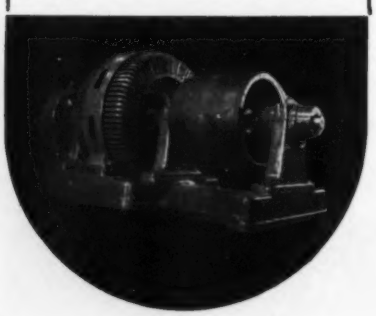

NECROLOGY

RALPH BATEMAN

On May 3, Ralph Bateman, vice president of the Ontario-Minnesota Pulp and Paper Company Limited, Kenora, Ontario, passed away after an extended illness.

Mr. Bateman was born in Goole, Yorkshire, England, in 1880. He emigrated to the Dominion in 1908 and obtained his experience in eastern Canadian sawmills and lumber camps. He served in World War I and was discharged with the rank of major. He then became associated with the Keewatin Box Factory at St. Boniface, Manitoba. In 1936, he was named resident manager and was later promoted to the vice presidency of the Ontario-Minnesota Pulp and Paper Company, Limited, as wholly-owned subsidiary of the Minnesota and Ontario Paper Company.

The widow survives.

◆

WILLIAM M. GROHMANN

Considered among the leading papermaking authorities in the country, William M. Grohmann, of Pine Terrace, Demarest, New Jersey, passed away on May 4.

Mr. Grohmann was head of the Franklin Research Company, of Philadelphia, and he had perfected a wax emulsion for more efficient sizing of paper. His product was widely used during the last World War by the Navy in the preparation of nautical charts designed for combat areas.

Born in Germany, Mr. Grohmann came to this country fifty years ago. He was 71 years of age. He is survived by his widow and a son.

◆

▶▶▶ Chief forester for the Florida Pulp and Paper Company, Pensacola, Florida, *Myron S. Kahler,* passed away suddenly at Cantonment late in May. Previous to his connection with the Florida company, Mr. Kahler was for a number of years manager of the woodlands division of the Union Bag and Paper Corporation, Savannah, Georgia.

◆

▶▶▶ *Horace B. Everitt,* 52 years old, purchasing agent for the Southern Kraft Paper Mill, a subsidiary of the International Paper Company, passed away at Panama City, Florida, May 25. He had been connected with the kraft mill in that city since 1920.

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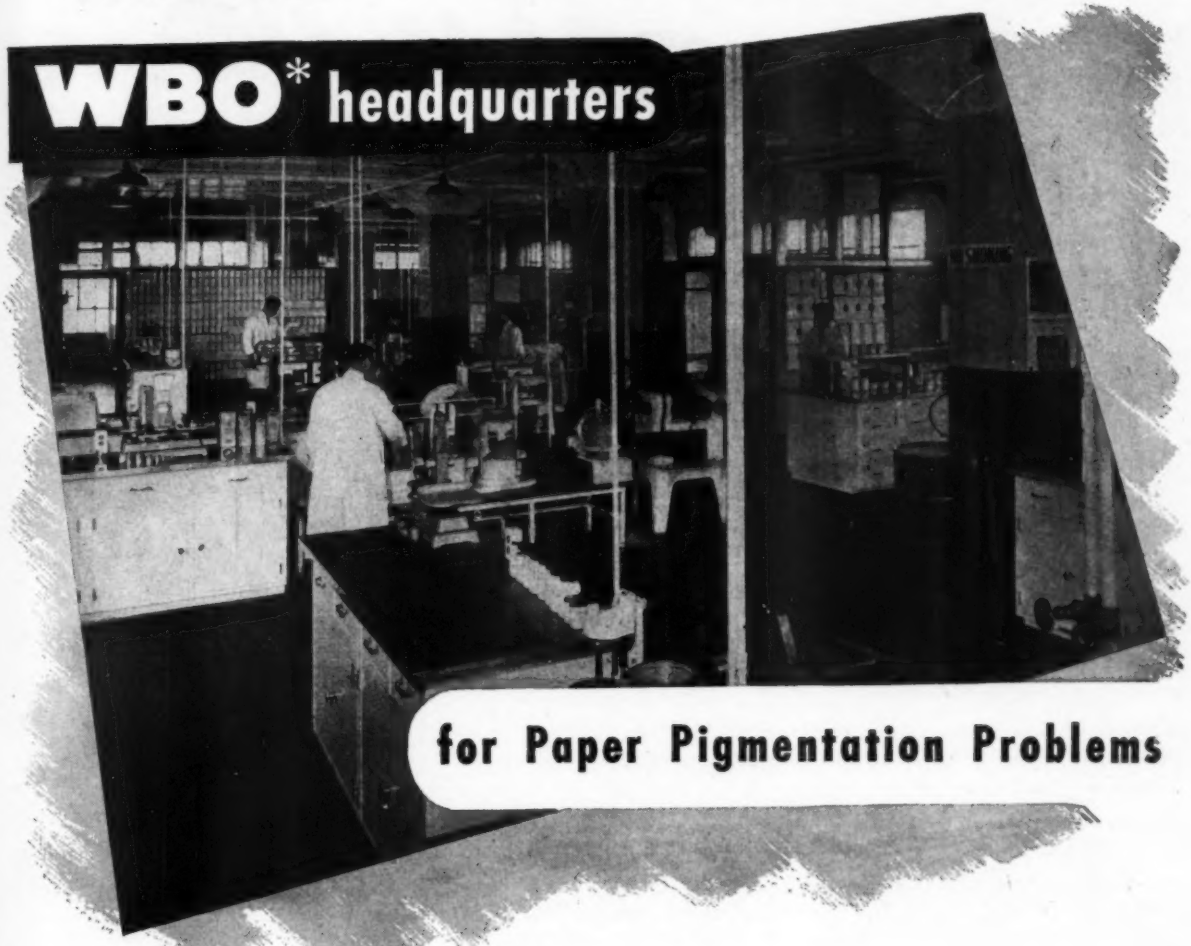
WBO* headquarters



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for KEENER COMPETITION

A NEW PRODUCTION CHALLENGE!

● The principal markets of today and tomorrow will go to the best-equipped, most efficient producers. Will your plant be among these leaders?

Modern equipment, the key to this new, highly competitive era, includes more than efficient machinery . . . it takes in every corner of your plant.

Consider valves, for example. Good valves are necessary for operating efficiency. LUNKENHEIMER VALVES meet every requirement, for dependable service. Proved through the years . . . in every industry . . . under the most exacting conditions, they deliver longer service at lower maintenance cost. Industrial users trust LUNKENHEIMER VALVES—know they combine carefully selected materials, advanced design and superior workmanship, backed by 85 years of valve manufacturing experience.

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"QUALITY"

CINCINNATI 14, OHIO. U. S. A.

And, backing up this high quality . . . insuring utmost satisfaction, is a nation-wide service organization. The next time you have a valve problem . . . installation, maintenance, repair or operation . . . call your Lunkenheimer Distributor. You'll find his service, like that of LUNKENHEIMER VALVES, truly dependable —always.

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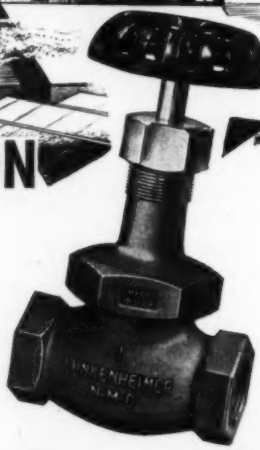

Fig. 123
"N-M-D"
Globe

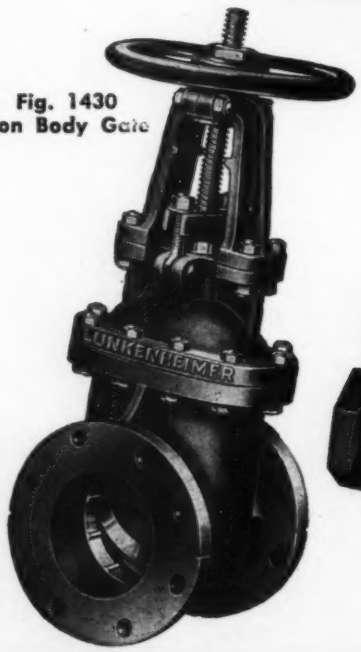

Fig. 1430
Iron Body Gate

Fig. 2125
Bronze
Gate

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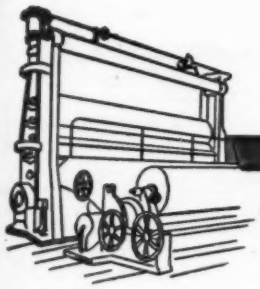
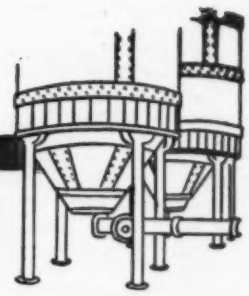
BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S. P.;
BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Electric Truck Maintenance Suggestions

Place industrial electric trucks under supervision of a competent and careful mechanic for thorough weekly inspections.

Insist on regular lubrication in accordance with the manufacturers recommendations.

Charge the maintenance man with keeping a complete log sheet or record on each truck.

This record should cover in detail weekly inspection findings, lubrication, all adjustments, and repairs. Thus any part calling for excessive care or repairs can be spotted; the cause investigated, and corrected before serious damage occurs. The names of persons performing each operation should be listed together with date performed.

Blow the dirt off each truck daily before proceeding with oiling the cold points. Wipe all oil holes clean, and make sure to oil all bearings, pins, joints and other "cold points" on brakes, and steering linkage, interlocking mechanisms and switch controls. Check battery in accordance with battery manufacturer's instructions.

Make a thorough weekly truck inspection of all of the following parts:

Brakes: Test service brakes for stopping with heaviest load to be carried. Test parking brakes for holding maximum load on steepest incline which truck must negotiate. Adjust the brakes as required. Inspect brake linings to make sure they are not filled with dirt or grease. If so, remove shoes and wash thoroughly in gasoline. If linking is worn, it should be replaced with grade of lining equal to original equipment. Make sure shoe is trued up to fit drum after relining. Inspect brake drum to make sure it is not scored or rough. Where brakes are timed with electrical interlock to main travel controller and contactors care must be taken not to disturb this timing when adjusting brakes.

Steering Connections: See that all connections are kept tight, but that steering control works freely.

Test for:

(a) Lost motion at ball joints and rod yokes due to wear.

(b) Tight joints at rod yokes due to bent levers or rods.

(c) Misalignment of steering wheels.

(d) Worn bearings in steering post or bell crank.

Excessive play in ball joints should be taken up by loosening lock nut and taking up on adjusting screw. If ball pins are badly worn, they should be replaced. Loose connections in rod yokes indicate pin or bearing wear, and should be replaced. Pins should be free at center, extreme right and left. Tight connections in rod yokes indicate bent or twisted rods. Straighten bent rods making sure lever faces are parallel. Always replace levers that are bent. Do not attempt to straighten them.

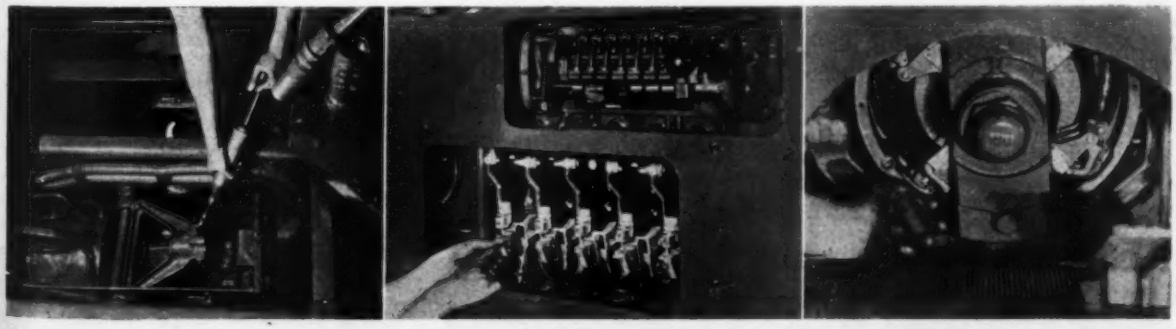
In replacing lever arms make sure taper hole in steering knuckle is not stretched out of shape and that key and keyway are in good condition. Keep pinch bolt tight in post lever to prevent damage to keyway.

Wheel Alignment: Never change rod lengths. Steering rods are made adjustable as to length to facilitate assembly at factory and should not require adjustment thereafter. Straighten rods that are bent and replace levers that are bent.

On four-wheel steer trucks the most usual cause of misalignment is the bending of the "C" lever, by hitting an obstruction. It is recognizable as follows:

With drive wheels straight, both trailing wheels will slant either right or left. Wheels are lined up exactly parallel at factory and employ no "toe-in." Check alignment by placing two long straight edges against side of power axle wheels, touching rims at two points and extending past trailing axle wheels. The drive wheels are adjusted by cross rods until parallel, checking distance between front and rear of straight edges. Trailing wheels are then adjusted parallel and checked by measuring in from straight edges until equal distance at front and rear from rims. Fore and aft steering rods are then adjusted. To co-ordinate front and rear steer, the tiller is moved, full throw away from operator. Measure distance from trailing wheel to frame; then reverse and check other wheel. If unequal, adjust 2 rods connecting bell crank until equal steer is obtained. Lock rods to correct length. Next check post lever, and adjust drag link so lever lacks 3" of lining up with drag link at full throw of tiller handle toward operator. If this 3" safety distance is decreased there is possibility that lever can be sprung over center, thereby locking steering mechanism.

Lift or Hoist: Clean all grease and dirt from rails. Inspect chains and anchor bolts. Inspect hydraulic lever to valve and limit switch. If valve plunger sticks, a few drops of machine oil should free it. If piston rod binds or leathers leak, a little neatsfoot oil on piston rod will work



LEFT—Lubricate regularly in accordance with manufacturer's recommendations. CENTER—Carefully inspect control equipment every month. Here the controller and contactor covers are removed and the mechanic is replacing a finger tip. RIGHT—Remove dust covers from motors and inspect commutators and brushes every month. Mechanic is making sure that brushes have at least 60 per cent bearing surface and are free in the brush holder

down and soften up leathers; or hydraulic hose may be disconnected at upper end of cylinder and a little neatsfoot oil inserted directly at leathers.

Lubrication: Carefully follow the manufacturer's instructions and lubricate each point called for on weekly lubrication. For most part, this will consist of Alemiting the steering connections and other bronze bushed parts. Over lubrication is almost as bad as under lubrication, and, therefore, parts such as motor and wheel bearings should not be included in weekly lubrications. Use only the best grade of lubricants obtainable, but never use any grease that has been exposed to dirt or dust. It is far cheaper to throw away such products than to replace parts that will quickly wear under such conditions.

Electrical Equipment: When working extremely dusty environments, it is ill to remove the covers from motors, controller, contactors and limit switches, and blow out any dust that may have worked into these parts. Bleed air line of moisture before blowing out electrical equipment.

The monthly inspection involves the inspection of the most important mechanical parts of a truck. Any slighting of these parts on inspection or lubrication can lead to expensive repairs.

Power Axle: Remove fill plug and inspect oil level. If losing oil, inspect for leaks. If truck is not operated sufficiently or at very low speeds, castor oil will not be carried up to worm and bearings, and they may develop a howl. To correct this, run truck at full speed several minutes, or jack-up one (1) wheel and run in high speed several minutes.

Wheel Universal Joint: Remove flange from power axle wheels. Wash parts in gasoline to remove all grease and dirt. Remove universal joint fork from universal ball. Inspect for wear. If badly worn, replace. The universal forks and ball should last indefinitely if properly lubricated and kept free from dirt and grit. Carefully inspect boot to make sure it is seating properly, and cloth has not worn through permitting the entrance of foreign material. Replace as required. making sure universal is taken out, washed and repacked with proper lubricant.

Wheel Bearings: Inspect wheel bearings while flanges are off for universal joint checkup, and repack with proper grade of lubricant.

Spindle Bearings: Place jack under axle and take weight off wheels. Check for play in spindles, which indicates ball has worn into socket, thereby throwing strain on axle shafts and differential spider. Dismantle and replace as required.

Drive and Torque Yokes: See that ball connections are kept tight and that anchor bolts are tight.

Oldham Coupling: See that cover is neither torn nor cracked thereby causing it to throw grease. Replace if required.

Trailing Axle and Wheels: Jack up axle so wheels clear floor. Test each wheel for looseness and end play on spindle. Also test for vertical play of knuckles with relation to support axle. If excessive play is apparent, dismantle and examine. Inspect bearings by removing hub cap. Pack with grease as required.

Brake Drum: See that nut holding brake drum on drive shaft is kept tight and that drum has not been allowed to loosen on shaft.

Motors: Remove dust covers and inspect commutator and brushes. Commutator should be bright, clean, and free from any pitting. Slots between bars should be clean and mica separations below level of commutator bars.

Brushes should have at least 60 per cent bearing surface and be free in brush holder. See that pigtails do not bend or touch any part of motor and that connections are tight. Circumferential setting of brushes is very important and is made by jig at factory and should never be changed. If brush holder has been allowed to become loosened, check and reset. Blow out commutator and brushes with air to clean out any dirt or dust that may have collected or gotten into motor when removing cover.

Controller: Remove controller cover and see that controller fingers are making proper contact on copper segments on the drum. Test the binding screws on the terminals for tightness. Make sure that all finger tips are in exact line and evenly spaced on neutral center. Keep fingers adjusted to 1/16-inch below segment heights, at neutral position, so fingers and drum will not pit. If, because of neglect, fingers and drum have pitted, they should be cleaned with a file or emery cloth and screws reset; if badly pitted, a light cut may be taken off the drum in a lathe. Lift each finger off controller drum individually to see that it works freely and snaps back quickly. If found to stick or act sluggish, place several drops of machine oil on hinge.

Contactor: Remove cover from contactors, with controller lever in first speed, depress pedal and note whether contacts are closing properly. These contacts take all the arcing in making and breaking the contact and must be replaced when worn. The contacts should never be filed. Interlock or auxiliary contacts should close just after main contacts touch, and never ahead of them. as all arcing must be in main contactor tips.

Limit Switches: Remove cover and inspect. See that proper contact is being made. See that binding screws are tight. Operate lever by hand to see that they are free. Operate controls to see that switches open at proper time.

Hydraulic Lift: The oil level in the hydraulic lift reservoir should be inspected once a month. Always make this check with platform down in its lowest position. Add required amount of the proper grade of hydraulic oil. It is also well to check the cleanliness of this oil. If it has become dirty or acquired foreign matter, entire system should immediately be drained and refilled with new clean oil. Dirty oil will cause hydraulic pump to wear quickly and also cause the valve to stick. Never permit the pump to run dry.

Lubrication: The monthly lubrication covers most of the mechanisms involved, and if slighted may develop into costly repairs. Therefore, it is well to exercise extreme care in the lubrication of these parts.

Twice yearly the industrial truck should be given a complete checkup. This checkup includes such things as changing the oil in the power axle, changing the hydraulic oil in the lift reservoir, taking out wheel bearings, cleaning and repacking them, if not done monthly. Special attention and inspection should be made of the wiring to make sure insulation is in good condition and check all electrical connections for tightness—*A. E. Dorod, Assistant Chief Engineer, Baker Industrial Truck Division* of the BAKER-RAULANG COMPANY.

◆

Use Larger Electrodes for Faster Arc Welding

Using larger electrodes for increased speed is not a new idea; it has frequently been advocated by welding engineers.

The following considerations will serve as a guide in changing successfully from smaller to larger electrodes.

Vertical Position of Welding

A 3/16 in. diameter electrode is the largest size with which it is practical for the average production operator to weld in the vertical and overhead position. Larger electrodes require amperages which produce too much heat for proper control of metal in vertical and overhead welds; as a result spatter loss is excessive, and poor welding results. Expert operators can use ¼-in. diameter AWS class E6013 electrodes successfully in the vertical position.

Fillet Size

An increase from 5/32-in. diameter to 3/16-in. diameter electrode is not recommended for vertical fillet welds until the size of the fillet reaches 5/16 in. or greater. A 5/32-in. diameter electrode is preferred for making ¼ in. and smaller fillet welds in the vertical position. A 3/16-in. diameter electrode applied to these smaller size fillet welds results in surplus weld metal being deposited in the form of a convex bulge on the fillet which would not contribute to strength and would waste scarce electrode material.

Plate Thickness

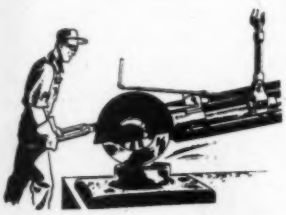
Many applications are such that the work either is or can be successfuly positioned for flat welding. In this, as in the vertical and overhead position, plate thickness will affect the maximum size electrodes that can be regarded as practical to use. Generally speaking, electrode diameters up to the plate thickness can be used. This is affected, however, by other conditions, such as fit-up, type of joints, etc. Electrodes are available in sizes up to ⅜-in. diameter. Larger sizes have not proved to be practical to date.—*H. O. Westendarp, Jr., Electric Welding Div.*, GENERAL ELECTRIC CO. (Schenectady, N. Y.).

Safety Around Grinding Wheels

Do's

Make sure that protective guards are properly in place, that tool rest is correctly adjusted and that exhaust systems are operating properly, before starting up grinding wheel.

Stand to one side of grinding wheel when first starting machine. If the wheel is defective it may break when starting up. Make sure that the correct type of abrasive wheel is used for the job to be performed. Check wheel and machine speed.



Wear an approved type of safety goggles at all times when using grinding wheel, even though working only a short time.

Keep tool rests as close as possible to the wheel — not over ⅛ inch. Apply moderate grinding pressure and take light cuts.

Keep grinding wheel properly dressed, so sharp abrasive grains are always exposed to the work and the wheel surface is smooth and symmetrical. Use nothing but an approved type of dresser.

Use a grinding wheel only if properly qualified by training and experience. When mounting a wheel, be sure the safety flanges are the right size and type, the blotter washers are installed and the wheel is held firmly, but not too tightly. A new wheel should be trued and balanced before it is put to work.

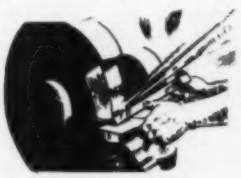
Don'ts

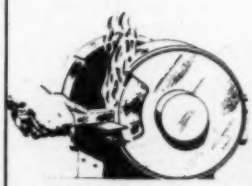
Don't operate grinding wheel with incomplete or faulty guards, or improperly operating exhaust system. Immediately report such faults to your foreman. Do not wear gloves when holding work against a grinding wheel.

Don't stand immediately in front of a grinding wheel when first starting it. A defective wheel is likely to break when starting and you may get severely hurt. In wet grinding, never permit a wheel to stand partially immersed in water, as the absorbed water will unbalance the wheel and possibly cause it to break while in operation.

Don't neglect to wear safety goggles when using a grinding wheel, or near a wheel that is being operated. Never remove goggles until your grinding work is finished.

Don't set tool rest too far from wheel, or apply too great grinding pressure to work. Do not apply work to side of wheel, unless the wheel is designed for that type of grinding.





Don't use a grinding wheel with a glazed and dull surface. A dull wheel causes unnecessary heating and requires excessive work pressure to grind a job. A dull wheel may be so irregular as to run out of balance. Do not dress a wheel unless properly trained.

Don't attempt to operate a grinding wheel unless properly qualified, as an inexperienced operator can very easily get hurt. Do not use the wrong type of wheel for the work to be done—check with your supervisor. Never leave wheel running unattended, even for short time.

Adapted from Industrial Safety Charts, Series F, U. S. Department of Labor

Convention Papers . . . Abridged

Abridgments in this section are from papers presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held at the Edgewater Beach Hotel, Chicago, May 22, 23, and 24, 1947.

Progress Report on Stock Preparation

LIONEL M. SUTHERLAND
Sutherland Refiner Corporation

Discussion of the subject of stock preparation has always been difficult even in normal times due to the many variations in furnishes, differences in equipment from mill to mill and varying ideas as to the best method of obtaining the desired result.

Today the subject is even more complex due to the insatiable demand for fiber in any form. Mills have learned, though oftentimes at a sacrifice in quality, how to use fibrous materials which they would have refused to consider using a few years ago.

Despite the ramifications of the industry and the tremendous number of grades manufactured, the papermaker depends principally upon two types of equipment for stock preparation. First to appear in extensive mill use was the Hollander beater and, at one time, it was truly said "paper is made in the beater." During the years many modifications were made in the original design, new ideas were developed and tried along the same lines, but today despite continued improvements, the beater is falling behind more rapidly as continuous systems are gaining in favor.

The other principal tool for stock preparation is, of course, the jordan engine and its several modifications. Obviously, in both the beater and jordan the tackle is varied according to the nature of the work required. For instance, a narrow bar jordan is referred to as a "cutting" jordan and a wide bar one as a "hydrating" jordan.

However the tackle is arranged, the basic principles of the jordan have changed but little since the earliest days and the power input remains high despite claims to the contrary. Improvements in materials, design and workmanship have not materially altered the above situation.

The Sutherland Refiner

In the past ten to fifteen years, the stock preparation field has been gradually changing and a third type of stock preparation machine has come into increasingly general use on a wide variety of grades. Reference, of course, is made to the Sutherland Single Rotating Disk Refiner. Today almost 2,000,000 tons of board and paper a year are produced in the U. S. with Sutherland Refiners. Of this total about 1,200,000 tons is in kraft liner board with the balance including toweling, corrugating, kraft bag and wrapping, tissue, book, bond, butchers and a number of allied grades. Some refiners are being used in pulp mills on high yield sulphate and sulphite pulps; also, in base refining pulps from soda type cooks.

Attrition mills are not a new idea in the paper industry as patent office records reveal numerous attempts to successfully adapt the principle of the disc refiner to stock preparation. However, despite numerous attempts, success with this type of equipment was not atttained until after Mr. D. Manson Sutherland had devoted several years of work to the study and development of this type of refiner. This work commenced in Canada in 1929 at which time some preliminary plant trials were made on groundwood screenings with a double rotation type unit. Results of the work, as may be expected, were not entirely satisfactory, but did provide information and data which was most helpful during the period of active development which followed.

Having confirmed the feasibility of the ideas, two other points were soon determined:

1. Double-rotation discs were power consuming and did not produce results to justify the added power required; therefore, future efforts were concentrated on single rotation.

2. Most refining equipment then available to the paper maker was not sufficiently rugged for the hard service imposed in the paper mill, so the decision was made that the best engineering and best materials available would be combined in the Sutherland refiner.

That this determination was carried out is shown by the record—during the war none of the approximately 70 refiners then in service were shutdown for necessary repairs and the annual cost of repairs—except for disc maintenance—is under 1 per cent of the initial investment cost.

Construction of Sutherland Refiner

The Sutherland refiner consists of a frame or bed supporting two sub-assemblies, one for the rotating disc and the other for the stationary disc (Figures 1 and 2).

The stationary end consists of a stainless steel disc, which bolts to a stationary head, also of stainless steel. The head is mounted on a stainless steel feed tube which is supported on plain bearings. Lateral movement of the stationary head is obtained by means of a hydraulic piston mounted on the feed tube. A pump and small motor supply the oil at pressures up to 400 psi, the movement being controlled by means of a hydraulic valve. Once the desired motor input power and pulp inlet pressure have been obtained the stationary end is locked in place by means of the leaking wheel and the hydraulic system is shutdown. This system gives the operator finger tip control of the refiner which is a much appreciated feature.

The rotating disc assembly consists of a disc bolted to a head which, in turn, is keyed to a nickel steel shaft. The radial load is carried by inboard and outboard double row roller bearings, which the thrust load is taken by a Kingsbury oil film thrust bearing. A lubricating system consisting of oil storage tank, gear pump, motor, cooler and filter is provided. A flexible coupling is supplied to direct-connect the motor and refiner.

Stainless steel has been used wherever the pulp contacts the metal. Close grained cast iron is used for the frame.

Performance

The next question and, perhaps the most important one from the paper-maker's viewpoint, is: "What will this ma-

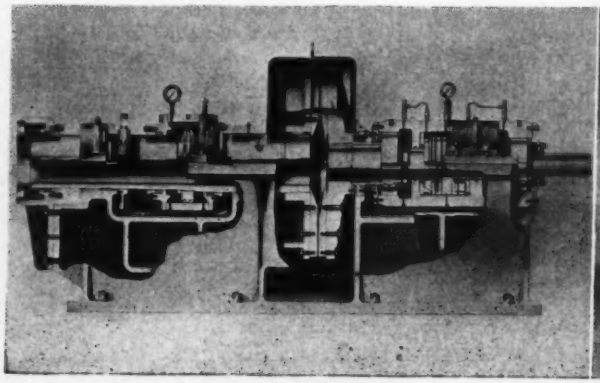


Figure 1

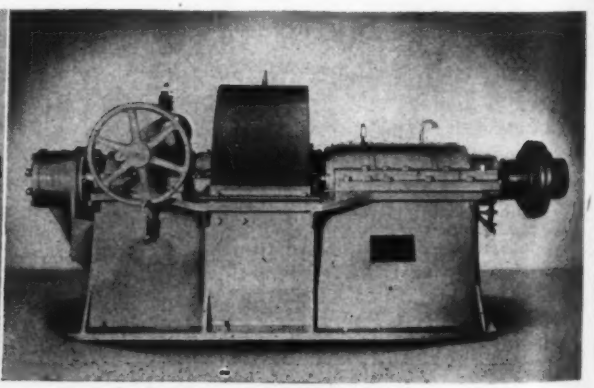


Figure 2

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chine do in my mill?" The best method of answering the question is to first collect complete information relative to your present operation, then install a Sutherland and again collect the facts!

A striking feature of the Sutherland refiner is the power saving, ranging from 35 to 65 per cent. One broad example is the kraft liner board field where Sutherlands are consuming 5-7 hp. days per ton while mills using other types of refining equipment are consuming from 9 to 14 hp. days/tons.

In a book mill a single Sutherland is preparing all the stock for each one of two paper machines producing a total of 95-100 tons of book paper per day or an average of 47-50 tons of finished paper per refiner. In this case, the furnish is about 90 per cent short fibered pulp. In another book mill, also producing bond, a 32" Sutherland refiner has replaced three pieces of stock preparation equipment producing 15 to 20 tons per day of book and bond with better formation, finish and better test—especially fold. In addition, the operators have the refiner delivering stock to the tray box so they can rapidly adjust the stock to suit conditions whereas they formerly had an hour's wait before a change was reflected on the wire.

Generally speaking, Sutherland Refiners at least equal test obtained with competing equipment and usually show better results in the significant test items.

A highly desirable characteristic is the early development of mullen with retention of tear. Sutherland refined stock, also, shows excellent folding properties and equal or better tensile test. Runs on kraft towelling have shown exceptional absorptive qualities with high wet pull and tensile as compared to results obtained with other equipment. Many other instances could also be cited.

A matter which is frequently overlooked in making high test papers is the operation of the paper machine. This works to the disadvantage of the stock preparation equipment in that poor test is blamed on the refiners, beaters, etc., when the fault may be due principally to headbox consistency, head of stock versus slice opening or, in other words, whether the stock is rushed or dragged onto the wire, vacuum, roll pressures and draws in the various machine sections. Dryer temperature and paper machine speed are other factors which affect test.

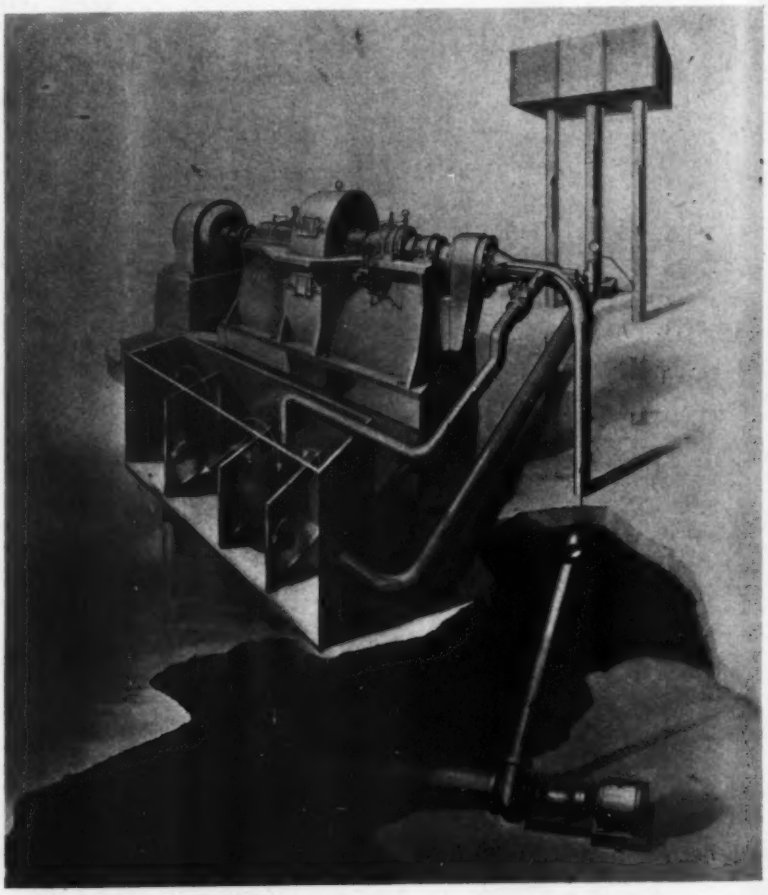
Maintenance

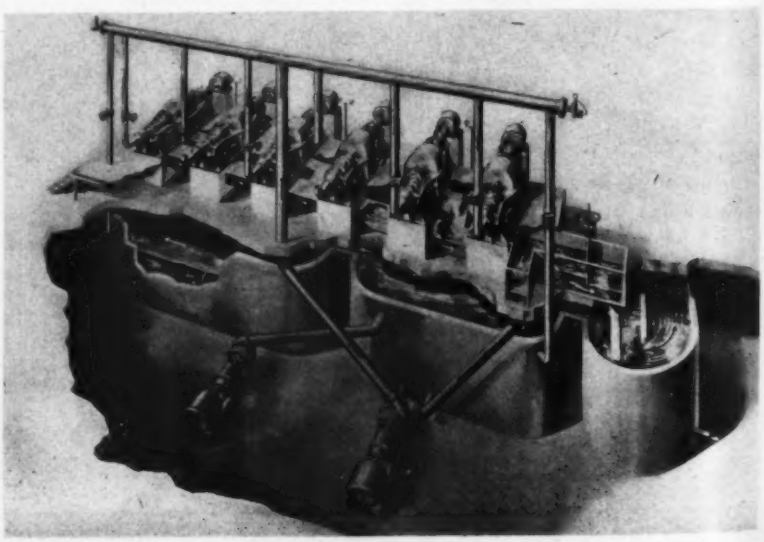
Ordinarily, only packing and gaskets require anything like regular replacement and that varies widely from mill to mill. Radial bearings are selected for heavy duty characteristics and have, with good maintenance, an average life of 100,000 hours or nearly 12 years. The Kingsbury thrust bearing is operated at about half of its rated load and is guaranteed almost indefinitely, provided the oil film is maintained between the shoes and the thrust collar. An electric pressure switch safety device is installed to shut down the refiner in the event of insufficient lubrication to prevent damage to these costly bearings.

The major item of maintenance is disc repair which consists in removing the worn discs and replacing them with a spare set which takes two hours or less for a two man crew.

The worn discs are then faced off and the disc pattern reproduced with a shaper. Remachining takes an average of about 50 hours in the machine shop although one mill claims as little as 30 hours machine time for repairing discs.

The usual manner of figuring disc wear is by the months elapsed from the startup until the disc is pulled for remachining. This varies widely even in similar types of service due to power load, freeness drop required, daily tonnage and care ex-





Figures 3 (above) and 4 (below) are phantom drawings showing Sutherland refiners and methods of stock circulation

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ercised by refiner operators in setting up the discs. One mill operating refiners at overloads up to 30 per cent obtains an average of a little better than five months wear. Most mills average 6-8 months disc life, while in one mill one pair of discs have been operating for 22 months, two other pair 15 months, and another set over 12 months without being removed from the refiner for regrooving.

Apparently the relatively high cost of the special alloy stainless steel discs is well known, but what is not so well understood is the fact that these discs may be recut a number of times before the disc is discarded. Based on considerable operating experience under varied conditions, it is apparent that disc life, conservatively estimated, is about 10 years since average wear before regrooving runs from .030 to .050 inch per disc and the discs when cast are over 2 inches thick.

During the past ten years the Sutherland Refiner has become a recognized piece of stock preparation equipment.

In the future, it is believed Sutherland Refiners will be used in making nearly all grades of paper where the tonnage involved warrants the investment in up-to-date modern stuff preparation equipment.

Characteristics of the Jacketed Steel Dryer Roll

GEORGE L. SNYDER, Asst. Mgr.
Development Engineering
Lukens Steel Company
By-Products Steel Corporation

Sufficient background in the use of jacketed steel dryer rolls in papermaking has been obtained to substantiate certain conclusions. One conclusion is that the jacketed steel dryer roll certainly has a place in the drying of paper. This does not mean that it is the answer to all drying problems, nor does it mean that it would be profitable to replace all existing dryers with those made of steel plate. As a matter of fact, much remains to be learned on the subject of jacketed steel dryer rolls.

From what is known thus far the jacketed steel dryer roll has certain basic characteristics of value. One of these, and it is important, is the greater strength and structural predictability of a steel plate dryer roll in contrast to a cast iron dryer roll.

In a recent comparison, steel dryer rolls with ½" outer shells were installed in a paper machine, replacing iron dryer rolls which had shells ⅞" thick, and which were operated at a pressure of 50 psi. The steel dryer rolls, each with approximately 40 per cent less thickness are operating at three times the pressure of the iron dryer rolls. To at least some degree the reduced thickness of the jacketed steel dryer roll results in better heat transfer.

Considering this basic comparison of strength of materials, the over-all weight of the average steel dryer roll, generally is less than that of cast iron. This characteristic offers another small advantage in that the mass to be rotated is less. This results in less power consumption which, in certain instances, is desirable.

Since the mass of material in a steel dryer roll is less, it naturally heats up faster when cold. This has been mentioned by users as an advantageous characteristic.

While much remains to be learned with the collaboration of your industry insofar as papermaking is concerned, no question remains in our mind that the jacketed steel dryer roll is a better heat exchanger. This conclusion rests mainly on experience gained during the last two years.

Recent experimentation with one installation shows approximately 15 per cent better heat transfer by direct comparison with cast iron dryer rolls replaced by those of jacketed steel.

It is believed that the dead steam, air and other gases, present to a greater degree in a single shell dryer roll, are largely eliminated or kept turbulent in the jacketed dryer roll. It is believed also that the effect of entrapped air and non-condensable gases is minimized because of their being washed out through this shallow annulus between inner and outer shell. It is believed that the "scrubbing" action of the increased velocity of steam is effective in disturbing the film moisture or gas on the inner surface of the shell. It is recognized that this film is an important insulator against heat transfer.

There are several different designs in use, dictated by the size of the dryer, and varying mainly in detail. Fundamentally, the basic principle is the same. Steam enters through one journal and is dispersed through the spokes into the space between inner and outer shell. Either it can be passed through the spokes at the other end of the dryer, thence out through the other journal, or the condensate can be returned through the same end of the dryer through which the steam enters.

It is our impression that those industries using cylindrical dryers tend toward greater operating pressures. The steel dryer roll by the nature of its material, obviously is suited to this trend. The jacketed construction is suited naturally, also, to high pressure since the unstayed area at the ends is reduced in comparison to that of a single shell dryer roll.

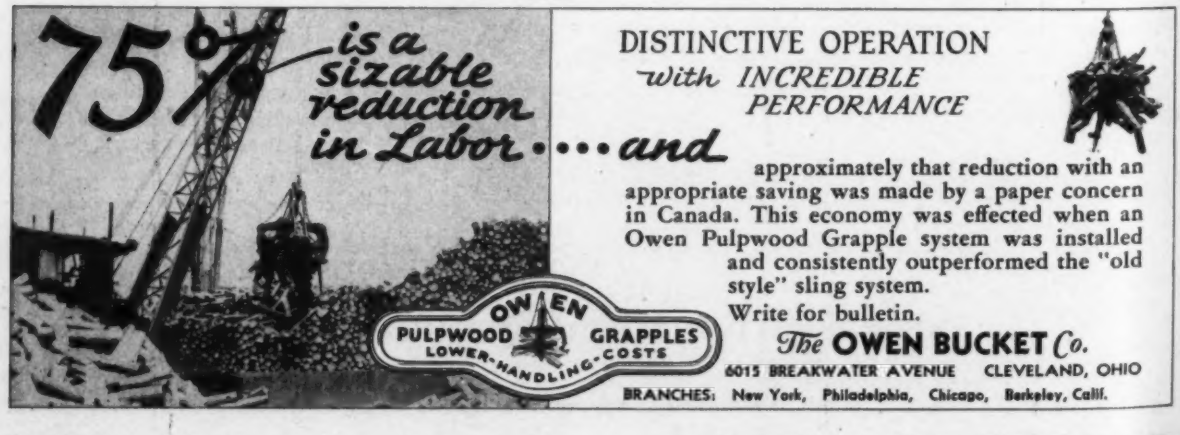
The benefit of high operating pressure is obvious whenever the resulting increase in temperature is permissible. This is shown conclusively by a recent experiment conducted under operating conditions.

Ten jacketed steel dryer rolls were installed at the dry end of a bank of 54 dryers. They replaced the last 10 cast iron dryers, leaving 44 iron dryers remaining in the system. No change in any other part of the machine, that might influence drying or over-all production, was made. The pressure in these 10 steel dryer rolls was increased to approximately 150 psi. The pressure in the 44 remaining iron dryers was held at the usual level of approximately 50 psi. The dryer rolls are each 36 in. in diameter by 116 in. face.

The machine produces roofing felt and floor covering. We are told by the user that an approximate average increase of 10 per cent in production has resulted. In addition, it has been reported that the final product contains less moisture on the average than it did before the installation of the jacketed steel dryer rolls.

From this it can be seen that the replacement of 18½ per cent of the number of dryers increased the over-all production of the machine by approximately 10 per cent. This, theoretically, adds up to a greater efficiency of approximately 54 per cent.

This conclusion is based simply on the fact that if 10 dryers introduced at three times operating pressure add 10 per cent production, 54 such dryers would add 54 per cent production. This, at least, is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true insofar as *increased available drying rate* is concerned.

Since the apparent increase in the instance just described was 54 per cent, the remaining theoretical increase of 20 per cent can be attributed only to the jacketed steel construction. The increase could not have come from any other factor, as no other change in the machine was made.

Naturally, we do not mean to imply that by changing of dryer rolls the production of any paper machine can be increased by 54 per cent. Many other factors influence such a change.

We feel that we are conservative when we tell you that the jacketed steel dryer roll is fundamentally 10 per cent to 20 per cent better as a heat exchanger. And this efficiency increases as the diameter increases above 36 inches.

In considering increased pressures it is, of course, fundamental that the resulting increased surface temperature be accompanied by a relative increase in speed. Stated in another way, increased temperature might "burn" the stock if speed were not increased. It is obvious that increased speed means increased production.

In using high-pressure steam in dryer rolls, there is always a problem of how to control this steam to the best advantage. There are many methods, such as using the steam from the dryer rolls in the hot air system, or reducing it and using it in low-pressure dryer rolls, or by using a system employed by Midwest Fulton.

In most installations using up to 150 psi, in dryer rolls the initial source of steam usually is 175 psi or higher. Instead of employing a conventional reducing valve, Midwest Fulton uses a steam jet in which the velocity of the higher pressure steam creates a suction on the return side of the system, as well as reduces the initial steam supply to the desired drying pressure.

The condensate return from the high pressure dryers is connected into a separator where the condensate is removed and can be returned to a feed water heater. The steam from the separator is then returned to the thermo-compressor and mixed with the higher pressure steam.

Under right conditions, the thermo-compressor can re-circulate twice as much steam through a dryer roll as is actually being condensed in the dryer roll. Again, this rapid circulation of steam through the dryer roll will create a constant drop in pressure from the inlet to the outlet of the dryer roll and eliminate the condensate as well as the noncondensable gases, and speed up the rate of heat transfer.

The jacketed steel dryer roll is of single-piece construction by its nature. This characteristic may be considered of minor importance, but it is a fact that bolted, sealed areas of large extent do not exist. Undoubtedly, this becomes increasingly important in dryer rolls of large diamter.

A series of new laboratory experiments are being planned by which it is hoped our knowledge of basic fundamentals may be enhanced. However, these experiments will be held in abeyance to await the assembling of more complete data on the operating characteristics

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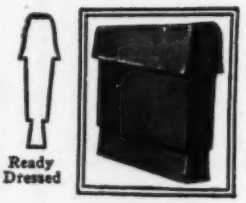

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of the jacketed dryer roll. In the mean time, any suggestions on possible experiments will be welcomed. Finally, a more rounded picture of over-all efficiency data may be expected. Further the design proportions of the jacketed dryer roll may be refined. Eventually, we expect to see the jacketed steel dryer roll used in all applications where its characteristics are of value.

The paper industry, in its position as probably the largest user of cylindrical dryers undoubtedly will set the pace for increased knowledge acquired.

The Science of Material Handling

MAXWELL A. GOODWIN
Clark Tructractor Div.
Clark Equipment Company

Much attention is justifiably being given to the moving of things, or material handling methods, for the very obvious reason that this activity involves non-productive costs which may readily be reduced.

The particular term "material handling" may be divided into external and internal transportation. The two groups are so closely knitted that the progress of each is dependent on the other.

Like other industries, paper mills are becoming progressive in their material handling methods and are taking advantage of the fairly obvious savings which may be obtained through reduced handling costs.

The steps to be taken to reduce handling costs are relatively simple.

First, study the flow of material through the plant.

Second, analyze existing handling methods.

Third, study other methods available.

Fourth, apply the most suitable improved method.

In paper mill handling, one of the big tonnage items is pulp. This product in bales readily adapts itself to being handled by a fork lift truck equipped with tapered smooth forks, which may be forced under the load permitting it to be lifted and discharged at will without any skids or pallets beneath the load. Many paper mills are using this method already on their receiving platforms for unloading baled pulp from cars, discharging it on scales, picking it up again and discharging it into storage or to the beginning of manufacturing processes. When large open bay storage areas are equipped with overhead cranes, the fork lift truck readily feeds bales to, and removes them from, the range of the crane.

In some instances, pulp is being handled on pallets and with a regular fork lift truck, where the steps are the same as mentioned for the tapered fork operation, except that material stays on a pallet and is tiered into and out of storage in that manner. Other products handled on pallets include bagged materials such as clay and chemicals. Bulk materials such as chemicals may also be handled with a fork lift truck equipped with a removable scoop attachment. Where long hauls are involved, palletized loads should be placed on tractor trailer trains at one end and removed from the trailers at the other end with a fork lift truck which does not travel the long distance between points of activity. Fork lift trucks in addition may be equipped with roll handling scoops and rotating devices to pick up rolls of paper in any position and rotating 90 degrees for storage or shipment in another position.

Let me give several specific examples of savings made in handling at paper mills.

1. In one instance the commodity handled was bagged goods. These arrived in freight cars and were unloaded at a cost of $1.10 a ton. When this same operation was adapted to palletizing at the receiving dock, the cost per ton dropped to 39 cents, or a saving of 71 cents per ton through the use of a fork lift truck.

2. Another example is a general receiving and shipping dock where the crew was reduced from nine men to three men by the use of one fork lift truck.

3. In one instance pulp was unloaded from cars using a crew of six men and requiring approximately four hours or a total of twenty-four man hours per car. With one fork lift truck and two men the same material was unloaded in less than two hours or the equivalent of six man hours. The resulting saving was eighteen man hours per car.

4. Another example was handling

rolls of paper into cars. The hand method took six men from four to five hours, or approximately twenty-four man hours per car. With a fork lift truck and two men the operation took from forty-five minutes to one and a half hours, or approximately four man hours total, with a saving of twenty man hours per car.

Apparently one of the reasons for slow progress of improved handling methods is a lack of understanding of the large percentage of wages which are paid to handling labor. Current estimates are that an average of twenty per cent of all labor costs are paid for material handling. Improved methods not only result in reducing labor costs but also result in the following:

1. Increased production per employee
2. Reduced inventories
3. Improved utilization of existing manufacturing and storage space
4. Decreased damage to material

Alert management today is establishing centralized material handling responsibility and authority in their organization. This solution should be given consideration, and when a man is appointed he should be given plenty of authority to co-ordinate the various departments involved.

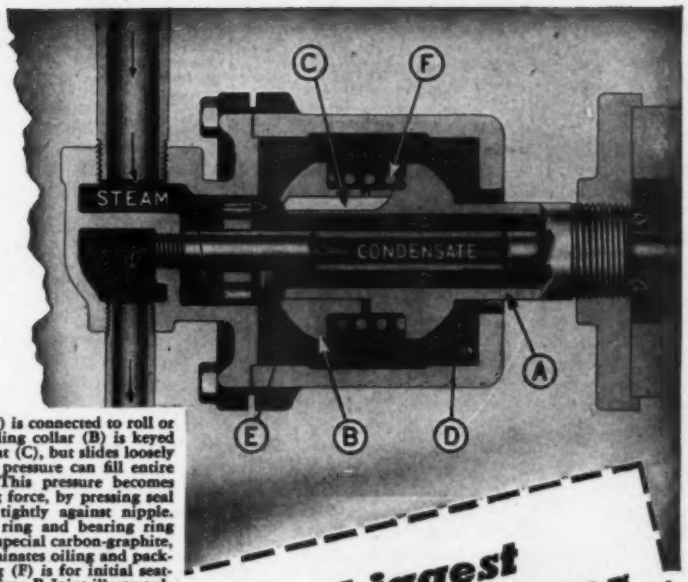
The Bird Dirtec and Its Application to the Cleaning of Paper Stock

FRANK F. FROTHINGHAM
Bird Machine Co.

As builders of Bird Screens and Centrifiners for cleaning paper stock and of Jonsson Vibrating Screens and Vibrotor Screens for pulp (the latter so new that we aren't even ready to talk about it yet), my company has what you might call a "vested interest" in the problem of removing dirt from pulp and paper. It was natural, therefore, that we should be interested in still another method of dirt removal than that of removal by size, as in the case of screens or by centrifugal multiplication of the force of gravity, as in the case of centrifining. I am speaking of dirt removal by pressure drop which is accomplished in a relatively simple device which we call the Dirtec.

The inlet of the Dirtec is located on the side near the top and at right angles to the unit itself. The inlet capacity of a single primary Dirtec is 280 gallons per minute, the number of units employed for any given installation depending on the volume to be handled.

The pressure at which the stock enters the Dirtec is between 35 and 40 pounds. Consistency may be whatever occurs at the paper machine. If it is around .5 per cent so much the better. The inlet is so shaped as to impart a downward spiral motion to the stock. Entering the vortex chamber the stock experiences a sharp drop in pressure and this plus the whirling motion of the stock has the effect of exaggerating differences in specific gravity between dirt and foreign matter and the fibers. The dirt is then passed without riling it up in any way to the separating chamber which is below the conical baffle near the center of the Dirtec and adja-



Nipple (A) is connected to roll or drum. Sliding collar (B) is keyed to nipple at (C), but slides loosely over it so pressure can fill entire housing. This pressure becomes the sealing force, by pressing seal ring (D) tightly against nipple. Both seal ring and bearing ring (E) are of special carbon-graphite, which eliminates oiling and packing. Spring (F) is for initial seating only. Type B Joint illustrated; other types, sizes for all needs.

...it's the biggest little trouble-saver in the mill...

In terms of physical size alone, the Johnson Joint could hardly be called big machinery. But in its ability to save time and trouble, and promote plant efficiency, its stature approaches anything the industry has ever seen.

The Johnson Joint was designed to go after the old stuffing box and steam fit troubles in a business-like way, and it literally knocks the stuffing out of them. There's no packing of any kind. There's no oiling required, ever. There's no adjusting — the higher the pressure, the tighter the seal. There's little to fear from misalignment—with provision for both lateral and angular movement built right in. Note besides how neatly it provides for more efficient syphon drainage, through the same head that admits the steam.

In dollars and cents, what does all this add up to? Well . . . enough at least to pay the cost of switching over to Johnson Joints in just a short while. Enough certainly to make the Johnson Joint too big to overlook.

Write for literature and the name of your nearby Johnson representative.

JOHNSON
Rotary Pressure
JOINTS

THE JOHNSON CORPORATION
845 WOOD STREET
THREE RIVERS, MICHIGAN

cent to an outlet to the auxiliary section of the unit. Advantage is taken in the separating chamber of the fact that the dirt has been separated according to its specific gravity. The heavier dirt remains in the outer portion of the column and is removed and collected in the sump at the base of the primary section of the machine. The finer dirt of greater weight than the fiber, and the light dirt grades itself towards the center of the column and is transferred to the auxiliary section which puts it through another vortex treatment and collects the dirt at its base. This auxiliary section operates as an integral unit with the primary section, without pumping in between. The pressure in the primary section is sufficient to operate the auxiliary section. It is an exceedingly simple and effective hookup. The accepted stock from the auxiliary section is returned to the stock supply ahead of the primary section. The collected dirt is removed periodically without interrupting the operation of the machine. The valves just above the sumps at the base of each section are closed, the sumps cleaned out and filled with water and the valves opened. That's all there is to it and the dirt no longer has a chance to sneak back into the stock. It's out for good and all.

The hookup of primary and auxiliary sections depends on the nature of the dirt present in the stock. In some cases, one auxiliary is employed for every three primaries. In some cases, one auxiliary is used with two primaries and other cases one auxiliary with each primary.

The capacity of a single auxiliary unit is 30 gallons per minute. The output of clean stock from each primary Dirtec, therefore, varies from 250 to 270 gallons per minute, depending on the number of auxiliaries used with the installation.

The operation of the Dirtec is very simple—nothing to attend to or adjust beyond the occasional removal of the dirt at the bottom of the machine. No moving parts. It takes up very little room and is easy to install both ahead of the paper machine screens and after the screens as a tailings unit.

This latter application of the Dirtec is proving a lot more satisfactory and efficient than auxiliary screens and it has already become standard practice on new screen installations. One primary-auxiliary Dirtec unit per screen does the job. The tailings from the bottom of the screen and from the skimming compartments at the discharge end of the screen are pumped directly to the Dirtec. All of this concentrated dirt—the heavy dirt rejected by the screen plates, the fine heavy dirt that settles to the bottom of the screen, and the floating dirt collected in the skimming boxes—is neatly and completely removed by the Dirtec and the clean stock returned right to the screen. Fiber loss from the Dirtec is insignificant —not over 3 lb. of stock per day per unit.

One great advantage of the Dirtec for handling screen tailings, besides its superior efficiency as a dirt remover, is its ability to handle a much greater volume of tailings than an auxiliary screen—two or three times the volume. This means vastly improved circulation of stock through the screen and this, in turn, increases dirt removal efficiency because dirt cannot accumulate and get back into the screened stock. Obviously one Dirtec per screen takes up far less space than an auxiliary screen and it makes an exceedingly neat and clean installation.

One specialty mill that makes papers that have to be extra clean from stock that contains a lot of hard-to-separate dirt has installed two Dirtecs, with a single auxiliary section for both, at the end of the line, following screens and Centrifiners. They found that they could thus save close to a hundred dollars' worth of stock per day because of the ability of the Dirtec installation to handle the stock from the daily cleanup of the Centrifiners. They pump the screen tailings, Centrifiner washdowns and all the water, wet broke and trim from the couch pit right through the Dirtecs before it goes to the Bird Save-all. They find that the entire cleaning and removery system operates better as well as paying a substantial profit in the form of stock savings. The Dirtecs permit running 10 to 15 per cent tailings without loss of stock since it all goes through the Dirtecs and the save-all. The fiber content of the save-all feed is increased and this steps up recovery efficiency. Tests sheets of the residue from the Dirtecs show that it is taking out not only the heavy dirt but the shives and grease, both of which are present in considerable quantity in this particular stock.

Another mill had a problem with rope stock. They had a whole rotary boiler full of rope that had been cooked but which they couldn't use because of a greasy black graphite in the rope. It was finally decided to run this stock out as wet broke, passing it through a Dirtec. The stock was then run on the paper machine without any trouble. Here was a practical demonstration of the Dirtec's ability to remove difficult dirt that nearly paid for the installation from this one batch.

Timber, the Key to Southern Industrial Expansion

J. W. TUCKER, JR. and J. M. McCLURD
Brunswick Pulp & Paper Co.

The pulp and paper industry, accounting for approximately ten per cent of the drain on living southern timber, has, must and will be the *strong influence* toward protecting and increasing the productivity of our southern timbered lands.

Our goal of land management at Brunswick, along with other progressive pulp and paper companies, is "sustained maximum production of wood on our lands and education of and assistance to smaller land owners within our working circle."

Our first task is that of affording adequate protection to our standing timber and young growth; in this connection, state wide fire protection is badly needed. There is currently a healthy growth of public opinion in this direction and in the meantime progressive counties have well organized fire protection units financed with county funds and by the State Division of Forestry. County protection is supplemented by fire protection units of large land owners, notably those established and maintained by pulp and paper companies.

The second phase of land management is in the realm of silviculture; that is the application of such cutting practices as will yield maximum sustained growth of wood on our lands. This subject has been too long neglected in the south; however, the pulp and paper industry, aided by its conservation association and state and federal services, is leading in the development of cutting practices best suited to our species, soil and climate.

Many pulp and paper mills were established in the southern pine belt between 1930 and 1940; during the earlier of these years our pulpwood supply appeared almost inexhaustible. Labor was plentiful and cheap; our forests generally were crowded with worked out turpentine trees and other timber with little or no market value; large acreages were not producing a yearly increment with a market value sufficient to pay taxes, interest and management costs. It is no wonder, during these years, that timber and production methods were considered of minor importance.

The southern pulp and paper industry is today facing the problem of harvesting its timber more efficiently. How well we meet this challenge may determine the southern standard of living for future generations. Some progress has been made in this connection and we wish to express our appreciation to the many manufacturers who are actively interesting themselves in this field. We would like to mention "Cotton" Johnson of Chesapeake Corporation who has pioneered in the handling of long wood, Tom Busch of International Paper Company, who has developed an operation based on a shuttle system of semi-trailers with demountable axles that will operate on crawler tracks or pneumatic tires, Larry Montague of Sumter, South Carolina, inventor of a portable pulpwood mill, and Ray Bower of Rayonier Corporation, who has made exhaustive studies of tractor-sulky skidding.

Our attention at Brunswick to the problem of logging southern pulpwood has narrowed down to those methods and kinds of equipment that will best serve the small or average logger. This man, making a thinning or selective cut, must as a result of our southern forestry program, produce the bulk of our pulpwood for many years to come. Some of the basic requirements of such an operation are:

1. It must be profitable on a light cut per acre.
2. By taking advantage of weather conditions this operation must do a complete logging job; the day is past when we can skim the easy to get timber off the hills and leave the flats and branches.
3. It must work equally well for mill, rail or barge delivery.
4. Man-hours per unit of production and idle time on trucks must be greatly reduced.

In this connection, our most successful

WHEN A MAINE MAN TAKES A JOB

"When I took my job here, I took it with the intention of *keeping* it. Now there's only one way to keep a job—and that's to do it well. Been here eleven years now, but that isn't long for a Maine man. Come back eleven years from today, and I bet you'll still find me here.

"Meanwhile, my son has been discharged from the army and has joined the same plant. I'm mighty pleased about this. I like the company so well, that I wouldn't want my son to work anywhere else. He likes it here, too.

"My boy wasn't the only Maloon to put on a uniform. I'm a lieutenant of the State Guard. I like to feel I'm being useful—useful when I'm at work—useful during my spare time.

"I have lots of hobbies, too—chief one's bird hunting. I have three dogs and I raise pheasants for training. Like amateur photography, too. Hobbies keep a man keen—keep his mind keen, his eye keen and his hand keen.

"I have a job that I like—I have hobbies that I like. I can say truthfully that it's a great life up here in Maine."

Leonard E Maloon

We could talk about Maine's moderately priced power—about Maine's proximity to America's largest industrial goods and consumer ace markets—about Maine's rich resources, pure processing water, fair taxes, year round "production weather", excellent transportation facilities. But the big plus about Maine as a site for industry, is that the spirit of Mr. Maloon is typical of the working men and women throughout Maine.

It would pay to investigate the industrial possibilities of Maine, if you are thinking of moving, expanding or decentralizing. Send for free booklet, "Industrial Maine".

STATE OF MAINE PAPER INDUSTRY

MAINE DEVELOPMENT COMMISSION, STATE HOUSE, AUGUSTA, MAINE

Advanced PEERLESS JET PUMPS

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CAPACITIES: 120 to 7500 Gals. per Hour. FROM WELL DEPTHS TO 120 FEET.

The Peerless engineering achievement of designing and building more efficient pumps with fewer moving parts has again been most successfully applied in the advanced Peerless Jet Pumping System. The trouble-free Peerless Jet Pump principle ingeniously applies the natural force of gravity, plus a minimum of mechanical power, to lift water upward by pressure from the Jet and force it to a pressure tank by means of an impeller. There is no simpler pump principle now being utilized where water lift requirements are comparable.

Peerless Jet Pumps are easy to understand, install, operate and maintain. Once the constant-pressure Jet Pump is in operation, adjustment or repair is rarely needed. Extremely compact in design. Double or single pipe systems available in sizes from ¼ to 3 H.P. Quietly supplies the water you require whether installed over the well or offset at a distance from the water source.

The surprisingly low initial cost of this precision-built Peerless Jet Pump will soon be absorbed through measurable savings in essential time, added convenience and overall operating economy.

Ideally applied to wells 2" inside diameter and larger for water supply requirements of light industry including ice and refrigeration plants, creameries, dairies, milk plants, institutions, hotels, laundries, municipalities, schools, etc.

See The PEERLESS Water King

Unique in design and operation. For shallow well installation only.

CAPACITIES: 275 to 860 Gals. per Hour.

Fully protected Under R. Maineau U. S. & Canadian patents.

For trouble-free simplicity of operation, this unique pump utilizes the same "magic" pumping element of the Peerless Hi-Lift Pump. Hard chrome pumping element wholly positioned and protected within pump base is highly resistant to abrasive and corrosive action. Assures a clean constant water supply. Requires a minimum of space and attention. 100% automatic. Easily installed over well or offset.

Write for Bulletins describing these two most efficient pumps.

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operations are based on the following:

1. Skidding logs from the stump to a central loading point. Small crawler tractors, wheel tractors or mules are used for this work.

2. Logs are brought to a deck where they are bucked into pulpwood lengths and loaded directly on tubular pallets.

3. The truck arrives at the log deck and self loads these pallets and leaves in a matter of minutes.

Some of the advantages gained are:

1. The truck is not delayed in the woods for loading. Average daily truck production is greatly increased.

2. Truck always carries a uniform load and maintenance is reduced.

3. Where a logger is working his men on a "task" basis he has an improved method of measurement and pay.

4. Two handlings of wood are eliminated and physical strain on loaders greatly reduced.

5. The truck or transportation unit is separate from the woods crew; this is not a "line operation." If truck is temporarily delayed enroute, the woods crew will not lose time.

Brunswick has no company operations; our many producers using this system are independent loggers delivering wood to rail or mill. We make no claim that this method, using the equipment described, will serve all southern pulpwood loggers equally well. Loggers in our area are adopting this method in increasing numbers and report a minimum of one-third increase in production with no increase in labor.

This system of pulpwood handling was developed by the Tidewater Equipment Company, Brunswick, Georgia, a company specializing in the design and manufacture of equipment for southern loggers. The pallet assembly known as THE DIXIE SKID LOADER is available as standard units for single axle or tandem trucks.

The following abridgments are from papers presented at the annual meeting of the **Technical Section of the Canadian Pulp and Paper Association,** held in Montreal, Quebec, January 29, 31, 1947.

The Longitudinal Grinding of Wood

W. H. de MONTMORENCY
Research Associate
Pulp and Paper Research Institute of Canada

This paper is a progress report covering the work completed at the Pulp and Paper Research Institute of Canada on the investigation of Longitudinal Grinding suggested by the Mechanical Pulping Committee of the Techanical Section, Canadian Pulp and Paper Association.

Longitudinal, or tangential grinding may be defined as a method of grinding wood such that the direction of the stone movement is parallel to, rather than at right angles to, the fibers.

The longitudinal grinding of pulpwood dates back to 1883 at least, in which year a patent was granted to Freitag (German Patent 20141-1883. See "Handbuch der Papier Fabrikation" by Hofman, Second Edition, 1897) for a longitudinal grinder. At about the same time the Voith Company (Hofman, "Handbuch der Papier Fabrikation" Second Edition, 1897) designed a grinder for the same purpose. However, the transversal method of grinding soon supplanted all other methods due to its simplicity and cheapness. In more recent years Ellis (U. S. Patent No. 1,979,373, November 6, 1934) patented, and in co-operation with the Minnesota and Ontario Paper Company, operated a complicated longitudinal grinder which saw service during the period 1934-1941. This grinder produced a long fibered free pulp at an increased power cost over that of transverse grinding (Private communication).

W. Brecht (Work on an Experimental Wood Grinder, *Papier-Fabrikant* 33, 13: 113, March, 1935; 33, 14: 121, April 7, 1935; 33, 15: 129, April 14, 1935), in 1935, in reporting the results of an investigation of longitudinal and diagonal grinding stated, "The longitudinally and diagonally ground pulps have since disappeared as the increase of energy of the machine units made necessary the omission of the complicated apparatus for causing contact of the wood and stone and as developments were directed at moderating the specific energy consumption. No doubts have been raised concerning the very much higher energy requirements of longitudinal and diagonal grinding."

Preliminary work done on this investigation (Pulp and Paper Research Institute of Canada, Fifth Annual Report, 1945) (Pulp and Paper Research Institute of Canada, Laboratory Report No. 35) showed that the subject was more complicated than at first thought, the angle of attack of the stone upon the fibers, which reaches a maximum at the pocket edges, having a very considerable effect upon the type of pulp produced.

The grinders designed by Freitag, Voith and Ellis were complicated by the attempt to maintain the fibers in the wood at a tangent to the radius of the stone. Any departure from this relation of fibers to the curved stone surface results in grinding which is a combination of "end of grain" and tangential grinding.

Tangential grinding is virtually impossible using grinders of conventional design since almost immediately after contact is made between wood and stone the line of contact broadens and takes on the form of an arc of a circle.

The effect of this is to produce a combination of tangential and end of grain grinding.

In the present investigation all grinding done to date has been of the combination type. Steps are being taken to reduce the end of grain effect to negligible proportions, and the results of grinding under these conditions will be reported at a later date. It is worthy of note that

When you have a READING CRANE installed in your plant, you get a crane CUSTOM-BUILT to meet your specific materials handling operation—at no added engineering cost!

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1. LOWERS FIRST COST — Because READING CRANES offer you a choice of several interchangeable motor, control and hoisting units, you buy no "extras" to solve special handling problems.

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Brecht worked under the same conditions as prevailed during the work reported here.

Experimental Work

The Miniature Grinder—The grinder employed was that described by Edwards et al (Groundwood Studies III—Investigation of Process Variables Using a Miniature Grinder. Proceedings Technical Section, CPPA Jan. 1937, *Pulp Paper Mag. Canada* 38: No. 2, 121-132), except for the following changes:

(1) Flinger bars were attached to the stone retaining flanges so that pulp could not lodge between flanges and casing as had been the experience of previous operators. Pulp circulation within the casing was improved at the same time.

(2) The shower pipe was moved to occupy a position of "one o'clock" on the stone, and consisted of a ¼" pipe pierced by many fine holes in place of the former fish tail. This shower was moved to a corresponding position on the opposite side of the pocket when the stone direction was reversed.

(3) The grinder casing was closed in to form an annular space around the stone, except for the pocket area. All projections except for a ⅛" thermocouple element were removed. The thermocouple element was so inserted that only its diameter was opposed to the flow of pulp.

(4) Two "extraction windows" were fitted to the casing, the pulp being withdrawn from the windows opposite the pocket.

The Pulp Stone—The stone used was an open structure carborundum stone which had run 450 hours.

It carried a pattern put on by a 10-cut spiral burr with a 1½" lead. The pattern was quite deep. High grade pulp had been produced by this stone just previous to the beginning of this work. Stone surface speed was maintained at 3455 fpm throughout the experimental work.

The Wood—The wood employed was Sitka spruce cut from logs of such a diameter that the curvature of the growth rings in a 1½" by 1½" billet was negligible. All billets were approximately 1½" by 1¼" by 6'. Billets were selected carefully for lack of blemishes, and for uniformity of structure. They were sorted into groups of eight, and five groups of billets were ground under each test condition.

Method of Operation of the Grinder—A semi-continuous method of operation of the grinder was employed, as follows. For each experimental condition five groups of billets were ground, each group consisting of approximately 550 grams of wood (moisture free basis). The first group of each lot was used as a "warm up" only. The stone was run in a bath of hot water for one quarter hour, and then the first group of billets was ground. Any necessary changes in grinding pressure, shower water volume, etc. were made during this period. Following the grinding of the first group, a short stop was made for chart changing, adjustment of friction drag zero and meter reading. Pulp produced during this preliminary grinding was retained and treated as in all the following grinds. Necessarily some pulp (the quantity held by the casing) was held over into the following grind from each previous one. The pulp remaining in the casing at the end of a series was discarded. The error introduced by this procedure was small, as there was little variation from group to group when no changes were made in operating conditions and wood supply. It was found in most cases that the pulp produced by the "warm up" run was very similar to the pulp made later.

In this method of operation of the miniature grinder the shower water did not strike the stone except at the very beginning, when a rather stiff showering of the grinder surface was necessary. As soon as the casing filled up with pulp, and pulp circulation began, direct showering was discontinued, and the dilution water was directed against the inner casing wall. A pond of pulp formed upon the stone just in front of the pocket and bathed the stone continuously during grinding. Some adjustment of the pulp vents was necessary to maintain this pond of pulp at all times.

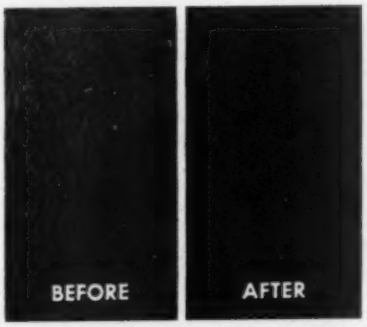
Observed and Recorded Data—Shower water temperature was observed and recorded at three-minute intervals. Pit temperature was recorded automatically by means of a recording thermometer. Friction drag was recorded automatically also. The friction drag apparatus was calibrated at the conclusion of each set of five grinds. Rate of advance was calculated from the total length of the group of billets and the net grinding time.

Treatment of Pulp Produced. — All pulp issuing from the grinder during the

Reconditioning Felts Safely and Speedily

When felts get "loaded," it isn't enough to clean them. Removal of foreign matter by scouring powders or ordinary soaps is apt to leave felts flat, harsh and non-absorbent, because of the unrinsed residues after the cleaning operation.

Magnus Felt Reconditioners, each of them designed to do a thorough cleaning job, are also designed to restore the nap,



bring back original softness and provide absorbency at a level close to that of a new felt.

There are four types of Magnus Felt Reconditioners: Magnus Felt Cleaner for heavily loaded felts; Magnus Feltex, for badly limed felts and for general felt reconditioning; Magnus NX, non-alkaline and neutral for special felts; and Magnus Saponex B for reconditioning where high rinsibility is desirable.

Effective Dispersal of Foreign Matter in Furnish

One of the most useful applications of Magnus Beatex is the dispersal of wax, ink and other foreign matter in furnish. Spotting and discoloration from these sources are so well controlled by the addition of Beatex in the beaters, that mill after mill has found it possible to increase the quantity of this kind of furnish in their stock.

Addition of 1/3 lb. of Magnus Beatex per 1000 lbs. of furnish is ample for effective dispersal of foreign matter. Beatex can be added before the furnish, but in most cases is charged into the beater after the furnish has been added.

Removes Sludge in Fuel Oil — Ends Clogging of Burner Nozzles

A company using a large volume of heavy fuel oil in its boilers recently asked its local Magnus man to recommend a cleaning material for removing carbonized deposits from burner nozzles. He offered Magnus 755, which did a quick, thorough job on the nozzles. He also told them that they were overlooking their main problem, stating that they had a lot of sludge in their storage tanks and supply lines. He had the answer to this problem also—Magnus Clerex.

Investigation showed the sludge was there, all right. And Magnus Clerex not only readily dispersed the sludge, but has prevented formation of deposits ever since. In fact, they still have 4 of the original 5 gallons of Magnus 755 they bought for cleaning burner nozzles that no longer have to be cleaned!

Removing Pitch from Fourdrinier Wire in Motion

Use a brush or broom dipped in Magnus Pitchex to treat all pitch spots on the wire as it passes the head of the machine. This emulsifiable solvent soap cleaner thus has the longest possible time to attack and loosen the spots before the showers are reached. Here the loosened and dispersed pitch is flushed away in the emulsion formed when the water mixes with the Pitchex. Wire can be kept consistently free from pitch by this method.

Magnus Chemical Company, 192 South Ave., Garwood, N. J. In Canada—Magnus Chemicals, Ltd., 4040 Rue Masson, Montreal 36, Que. *Advertisement*

grinding of a group of billets was collected, combined and sampled. Consistency and freeness determinations were made. The remaining pulp was diluted to approximately 1.5 per cent and the wet equivalent of 100 grams (moisture free basis) withdrawn. This wet sample was diluted in a single-plate 0.006 inch cut screen to approximately 1.35 per cent and screened. Accepted pulp was thickened on a 100-mesh screen, the white water being returned until clear. The rejected pulp upon the 0.006 inch screen plate was washed once with 10 litres of white water. The rejected material remaining after this washing was considered as "rejects," and was collected, dried and weighed. The thickened accepted or "No. 1 Pulp" was diluted to sheet making consistency and formed the basis for all test results reported except for "Pit Consistency" and "Pit Freeness."

Canadian Standard freeness and drainage factor determinations were made upon the No. 1 pulp. Johnston screen classifications were carried out also. Standard handsheets were made and the usual physical properties of the pulp determined.

Experimental Procedures and Results—Several simple comparisons were made of transverse and longitudinal grinding using the conditioned stone. Following this, a series of experiments was run to examine the effect of grinding pressure upon longitudinal grinding. Finally transverse and longitudinal grinding were compared using a comparatively unconditioned (sharp) stone surface. This sharp stone surface was obtained by reversing the direction of rotation of the conditioned stone.

During longitudinal grinding it was noted that the butts of billets exhibited a surface condition quite different from that of butts of transversely ground billets.

Transverse grinding produced a surface uniformly covered with fibers and fiber bundles attached at one end of the parent wood. Longitudinal grinding produced a surface almost devoid of fiber bundles for some distance in from the edge of the billet at which the stone entered followed by an area profusely covered by attached fiber bundles. Reversal of the billets did not change this condition, it being governed by the direction of travel of the stone surface across the face of the billet.

It appears that for a given stone surface condition and grinding pressure the results of grinding wood longitudinally rather than transversely are as follows:

(1) A marked drop in production in order of 60 per cent.

(2) A marked increase in power consumption in the order of 250-300 per cent based both on tonnage of pulp produced and on strength developed.

(3) A very great drop in freeness of the pulp to a point where freeness is but 10-15 per cent of that of transverse pulp.

(4) An increase in fines present in the pulp and a decrease in long fiber fraction.

(5) A moderate increase in bursting and tensile strengths in the order of 30 per cent.

(6) A decrease in tearing strength of approximately 30 per cent.

(7) A decrease in bulk of 10-20 per cent.

(8) A truly remarkable increase in air resistance of standard handsheets. This property is increased 10-20 fold.

(9) The production rate in longitudinal grinding can be increased readily by increasing the grinding pressure, but by so doing the strength advantage obtained by longitudinal grinding is lost. The freeness, although raised by the increase in grinding pressure, still remains very low. At high grinding pressures the proportion of screenings in the pulp becomes unacceptable.

(10) At a production rate equivalent to transverse grinding, the pulp produced by longitudinal grinding has approximately the same strength as transverse pulp, and lower freeness.

Under the experimental conditions obtaining in this investigation the longitudinal grinding of wood offers few advantages and several disadvantages as compared with the normal transverse method of grinding. For very special purposes the pulp so produced might provide a desired property such as oil resistance.

The practical mechanical performance of longitudinal grinding poses problems of such difficulty as to be overcome only by fundamental changes in grinder design.

This work on longitudinal grinding is to be continued in order that the influence of the angle of attack may be studied and information obtained on grinding which approaches more closely tangential grinding.

The Carlsson Printability Test for Newsprint

JOHN H. BARDSLEY[1] and LUCIEN J. MORIN[2]

If a test for printability be required, it seems logical that trial printing tests would be a good approach to the problem. This has been adopted by some mills in which a proof press has become the chief tool. The operation of a proof press requires, besides skill and judgment, a considerable amount of time. There is, however, another much simpler and more convenient tool; that is the Carlsson printing test (Quality Testing of Newsprint, *Pulp and Paper Mag. Canada*, June, 1939, page 421-427, and July, 1939, page 476-483) (Testing of News Inks, *Pulp and Paper Mag. Canada*, February, 1940, page 238-242; March, 1940, page 286-291).

Briefly the Carlsson method is as follows: A weighed amount of printing ink is transferred to a piece of plate glass of known area. The ink is spread over the plate glass to a uniform thickness by means of a brayer. The samples to be tested are then placed on the ink film on the glass plate, and the whole covered by sheets of newsprint. A loaded roller of known weight is then rolled back and forth several times over the cover sheets. After this, the samples are removed from the plate glass and the printed surface examined either visually or by a photoelectric brightness meter.

The original Carlsson technique called for the use of a rubber loaded roller and specified a weighting which gave a printed result similar to one obtained at low pressure printing.

Tests carried out under these conditions on samples supplied by the Newsprint Service Bureau gave blacks which varied from light grey to good blacks. Since virtually all these commercial newsprint samples are printed satisfactorily by their customers, either the tests were too critical, or they were done under conditions at wide variance with those met in practice.

Several experiments were made using various quantities of ink, various pressures, and also with weighted rubber and weighted brass rollers. It was soon confirmed that almost all samples got to virtually a perfect printing smoothness when enough ink or pressure were applied. The most important observation was that while samples of better printing smoothness, as observed at lower pressures, usually maintained their advantage at the higher pressures, there were some samples that, though poor at low pressure, became very good at the higher ones. This was particularly noticeable with wire marks; some very prominent wire marks disappeared at only moderate pressures while others required very high pressures.

The brass roller appeared to have certain advantages over the rubber roller used by Carlsson. It was found that to produce equivalent blackness only half the pressure was required. There was not nearly the degree of variation in the blackness of different samples experienced and also minor surface faults and suction press markings were minimized when the brass roll was used; also, printed newspapers or old exposed samples could be

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tested along with new paper directly from the rolls. This latter observation hinted that the printability of a sheet of newsprint is something that is built in and does not vary along with the usual measurable qualities. Because of the above, we have adopted the brass roller.

It must be pointed out that the joint authors of this paper are from different corporations and, as the modifications were developed more or less independently, they differ somewhat. It is significant that the two procedures are similar enough to be described under one heading.

The method as used by Carlsson depends on the photoelectric determination of the degree of blackness as the principal criterion of the printability of the news sheet under consideration. Bardsley discounts the importance of the degree of blackness and, instead, visually compares and grades the printed samples by the quality of the printed area. More consideration is given to the wire mark and surface deformities than to the average degree of blackness. Morin also discounts the importance of the degree of blackness and, instead, is concerned principally with the degree of strike-through or print-through.

Description of Method

The method used is essentially that of Carlsson. A sheet of plate glass, 24 in. by 14 in., is covered with a weighed amount of ink. The ink is weighed on a microscope slide (25 mg. per square decimeter being the usual amount) and wiped off onto the plate glass. The ink is rolled with an ink brayer until uniformly distributed, as determined by looking through the plate glass. Samples, cut 5 in. by 2½ in., are folded over so as to measure 2½ in. by 2½ in. and are placed in a row on the inked glass plate. Five sheets of newsprint are laid over the samples to form a blanket, and a brass roll, 6 in. by 2 in. dia., is passed back and forth five times over the samples. The brass roll is weighted to a definite amount, 25 lb. being the usual weight. After printing, the samples are compared visually for blackness and uniformity and are then set aside. After 24 hours, the samples are tested for reflectivity on a Bausch and Lomb opacimeter, in the manner described by Carlsson. The readings are taken, one on the unprinted portion of the sample, one on the printed side of the sample, and a third on the reverse side of the printed sample—again according to Carlsson.

Degree of blackness = log. reflectivity of unprinted paper minus log. reflectivity of printed paper.

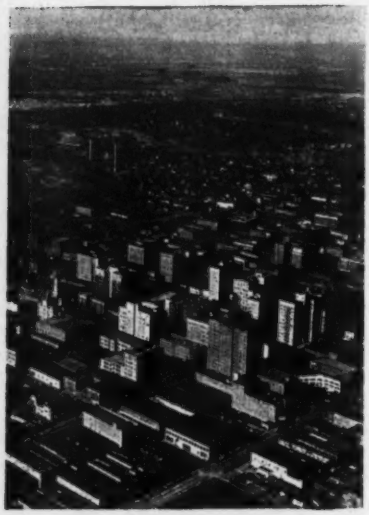
Degree of strike-through = log. reflectivity of unprinted paper minus log. reflectivity of reverse side of printed paper.

Printing and aging of samples should be done under standard conditions of temperature and humidity for consistent results. However, except under the extreme conditions of summer, valid comparisons have been obtained when the only control was that prevailing usually in the laboratory.

Carlsson has reported some very interesting results. He obtained, for each sample of newsprint, a degree of blackness and a degree of specific strike-through which were taken as characteristic of the sample tested. Such results are valuable to determine the printability of newsprint, but in spite of all efforts to standardize conditions we have not been able to obtain a value for blackness and strike-through characteristic of the sample as reported by Carlsson. While series of tests repeated at intervals of a week or so, graded several samples in much the same order, the order of magnitude of the results changed and no numerical value could then be given to printability.

This imposes restrictions on the value of the testing method, and, until such time as we may be able to improve our technique, we must restrict ourselves to comparing various samples among themselves. But since as many as eight samples can be printed together on both top and wire sides, it can be seen that the Carlsson test is still very useful in studying printability.

The interpretations of the results obtained require judgment, which is true of all printability tests. Printing smoothness and formation can be evaluated from the uniformity of the printed surface, and ink absorption properties from the blackness of the print. An examination of the reverse side may indicate over-calendering, as the ink penetrates considerably through any crushed area. Numerical values for strike-through and blackness may be ob-



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tained to confirm these observations. This test has been found particularly useful in the determination of the strike-through properties of newsprint. By printing the samples with increasing ink coverages and determining the blackness and strike-through values on the opacimeter, a curve is obtained giving the strike-through of the sample for increasing blackness. This curve we have taken as a measure of the strike-through properties.

We have not tried to develop the Carlsson method into a routine test. Rather than developing it into a rigidly standardized test, we have considered it as a tool to study special problems. The conditions have been altered as appeared suitable, and no effort was made to preserve continuity. Most of the work done involved comparison of several samples, and this was done by trial-printing the samples under a variety of conditions.

Some thought has been given to a correlation of the usual paper tests with trial printing. This has not been very successful.

Oil absorption and smoothness tests do not correspond with the printing test.

On the same machine, if the bulk be decreased by heavier calendering, blackness and uniformity are improved, but at the expense of strike-through. Different machines, using the same furnish, sometimes give totally different results. But, apparently, the greatest influence is exerted by the furnish, and variations from mill to mill can be fairly great.

The trial-printing method will show differences between samples which no other tests will show, and these differences have been confirmed, in some cases, by the performance of the paper in the press-room.

Besides such comparisons of paper or ink, the trial-printing method may be so modified as to indicate how neswprint will react under various conditions in the pressroom.

Printing pressures may be carried within fairly wide limits by increasing the weight of the impression roller. Using the same ink coverage, low printing pressures grade samples in the same order as higher pressures, but differences are accentuated. Smooth papers print equally well at both high and low pressures, uniformity and blackness being changed very little. Samples of a lower smoothness require more pressure to obtain uniform printing.

Strike-through shows little variation with printing pressure. Even at fairly low pressures newsprint picks up 90 to 95 per cent of the ink available on the plate. Though heavier printing pressures be used, enough additional ink cannot be picked up to have much effect on strike-through.

In our opinion the Carlsson technique is fully as good as that using a proof-press. It differs from commercial printing in that the paper is left in contact with the ink for a relatively long time, so that the speed of impression is nowhere comparable. It may also be difficult to convince a printer, accustomed to using precision presses, of the validity of results obtained with such rudimentary equipment. It is our hope that a proof-press may be designed embodying the best features of the Carlsson test, such as making the determination of the ink coverage easier and fixing the impression pressure by the weight of the roller rather than by the compression of the packing. Such a press would be very useful, since the printability of newsprint will be determined only by actually printing the paper.

Improvements and Extensions of Sulphite Facilities at Price Brothers & Company, Limited, Riverbend Mill

H. J. BARRATT, Plant Engineer
H. H. SEARS, Assistant Sulphite Supt.

This paper covers briefly a recently completed program of improvements and extensions of the sulphite facilities at the Riverbend mill. The program has embraced alterations of the acid plant and digester buildings, as well as the erection of complete new accumulator, knotter and screen room buildings.

Designs for the entire program were executed by the mill staff and erection of the new buildings was carried out by E.G.M. Cape & Company of Montreal.

Acid Plant

Two 4′ x 15′ Waterous rotary sulphur burners have been installed. These burners are lined with Stebbins cupola brick 4½″ thick and are driven by 5 hp. gear motors at 0.8 rpm. The sulphur is delivered by elevator and conveyor to two 6′ diam. melting kettles mounted over the burners. These kettles are fitted with steam coils and melted sulphur flows to the burners by gravity.

Two combustion chambers, 7′ 9″ wide by 11′ 6″ long by 13′ 9″ high, have been provided. These chambers have standard type linings and baffles. The arches are the Detrick flat suspended type arches. The coolers have been extended to give a total surface area of 3360 sq. ft. The original Appleton 18″ gas fan has been retained but increased to give a range of from 800 to 1400 rpm.

Acid plant instruments include one Leeds and Northrup Micromax SO_2 gas analyzer with model R recorder, one Leeds and Northrup Micromax six point temperature recorder, model S, and one Bristol flow meter measuring water to the acid towers.

Digesters

The digester installation consists of five 17′ x 54′ digesters with 7½″ linings having a capacity of approximately 8054 cubic feet. As part of the program the following improvements have been made.

(1) All digesters have been equipped with forced circulating systems.

(2) Blow lines and fittings of all digesters have been increased to 14″, the fittings being of cast KA2MO and the pipes cast iron. Blow valves are 14″ McAvity KA2MO valves, motor-operated by 3 hp, 1150 rpm. Hitorque motors through worm gearing.

(3) Digester instruments have been regrouped on individual instrument panels for each digester with the addition

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of instruments for automatic time-temperature cooking control.

(4) A complete Chemipulp hot acid recovery system has been installed.

(5) The program of changing all digester fittings and piping to chrome nickel steel has been completed. All fittings are cast KA2MO.

Piping is cast KA2MO light walled tubing being type 316.

Forced Circulating Systems

The forced circulating systems are the Hellstrom type. The collector ring placed halfway up the bottom cone has ¾" perforations with an effective open area of 2200 sq. in. per digester. Circulating pumps are Northern Foundry type SE-AA 10" x 8" stainless steel rated at 2600 US gpm, 60' head and driven by 60 hp. 1200 rpm motors. Circulating pump lines are 8" cast KA2MO pipe with sleeve-type expansion joints. Alpax No. 5 packing is used in these joints.

Instruments

Each digester has been fitted with an individual instrument panel. Each panel is equipped with a Foxboro Model 10, type 317 steam flow recorder; Bristol Model KP 5240 free vane, two-pen temperature controller, with cam, used for automatic time-temperature control of steaming range 40-150 C.; one Bristol Model 8040 MT free vane pressure controller, with cam, for automatic control of pressure—range 0-100 lb.; one Bristol Model 40 recording pressure gauge—range 0-150 lb.; one indicating pressure gauge—range 0-100 lb.; one Westinghouse indicating ammeter for circulating pump.

The operation of the time-temperature steam controllers is of particular interest as these digesters are, we believe, the first to be equipped with this type of control without the use of either a hydroheater or a heat exchanger.

Chemipulp Hot Acid Recovery System

The Chemipulp hot acid recovery system is the conventional type and needs little explanation.

Two all-welded Horton spherical accumulators 32' diam. have been erected. These have been housed in a building having structural steel frame with speed tile and brick walls. Roof deck is of Haydite with two layers of ¾" Donnacona shiplap and built-up roofing. The accumulators are lined with Stebbins double course lining, 7¼" thick, and have been designed for working pressures of 75 lb./sq. in. High pressure and low pressure eductor pumps are Canada Pumps Ltd. 4" x 3" type SAC, with rated capacity of 275 US gpm at 230' head. They are driven by 30 hp. 1800 rpm motors. The acid filling pump is a Canada Pumps ltd. type SL, 10" x 8" pump, rated at 2750 US gpm at 65' head, with 75 hp, 1800 rpm. motor. All pumps and piping are stainless steel, cast pipe being KA2MO and light wall tubing being type 316.

Relief Manifolds connect digesters through a Panl type strainer with high pressure, low pressure, vent and back-shot steam headers. Four inch side relief line also joins the manifold. The automatic pressure relief valve is located in by-pass on the manifold so that all relief, both wet and dry, can be taken through the pressure controller or direct to accumulators through manually-operated valves. High and low pressure relief headers connect all digesters with eductors. This manifold and header arrangement has greatly improved the appearance of our digester room. High pressure accumulator relief is taken into the low pressure accumulator through a drop-leg, and the low pressure accumulator exhausts to the acid storage tank, or can be by-passed to the acid plant. Pressure of the accumulators is controlled by Bristol automatic pressure controllers. Pressure, temperature, and liquid level of each accumulator is recorded on Bristol three-pen recorders.

Knot Screen Room

Particular care was taken in the design of the blow pit and knotter room arrangement to eliminate all pumping and agitation until after the stock has been knot-screened. Jonsson vibrating knot screens were installed in preference to the conventional rotary knotters.

The stock from the five 32' diam. circular wooden blow pits is sluiced by gravity through a 24" wood stave pipe to a tile-lined collecting chest. This chest is 31' long by 23' wide by 15' deep and is equipped with a mid-feather fall and 54" diam. fan blade rubber-covered agitator, operating at 105 rpm and taking 15 hp.

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Stock from this chest flows by gravity to a tile mix-box which is equipped with baffles and small paddle wheel agitator. Fresh water dilution, regulated by hand, is introduced at this point and is mixed and fed by gravity through a 20" pipe to four Jonsson vibrating knotters. These knotters are fitted with plates having ¼" diam. perforations and are driven by 5 hp. motors at a speed of 1450 vibrations per minute.

Throw of the screen is approximately ¼".

The accepted stock from the knotters drops to a tile lined collecting chest below and is pumped by Northern Foundry 16" x 14" vertical pumps to the new screen room. The tailings are sluiced to a pump box and pumped to the refiner system.

The Jonsson knotters have been operated up to 2 per cent moisture free consistency, but a consistency of 1.0 to 1.2 per cent moisture free has been found most satisfactory with a sulphite stock of 3.5 chlorine number, with knotter rejects of 1.5 per cent.

The capacity of the screen varies, of course, with the quality of the stock, and the per cent rejects. On our stock we have obtained capacities up to 120 tons a.d. per day under test. 75-100 tons a.d. per day should be handled without any difficulty on most types of sulphite stock.

Screen Room

The screen room is a three-story building 76' wide by 113' long. The basement is of reinforced concrete design and accommodates stock chests, pumping and agitator equipment. The remainder of the building is of structural steel frame with brick and tile walls, and concrete floors. Roof desk is of Haydite with Donnacona shiplap insulation. In place of windows, glass block has been used. The heating and ventilating system is by Ross Engineering of Canada Ltd. All incoming air is filtered and distributed to the various parts of the building with individual steam boosters, gradustat-controlled, to get regulated heat to each section.

The main floor accommodates pulp washing and deckering equipment as well as the Technical Laboratory. The accepted stock from the knotters is pumped to an 8' x 12' Sherbrooke rubber-covered washer where it is washed and thickened. The washer has a capacity of 250 tons a.d. per day thickening from 0.6 to 3.0 per cent moisture free consistency. White water from .002 to .003 per cent moisture free consistency is sewered. The washing stage guards against incomplete washing in the blow pits and provides a well for consistency regulation before the screens. The washed stock discharges to a tile-lined tank having a capacity of approximately 30 tons a.d. at a 3 per cent consistency. The tank is 86' long with mid-feather wall forming two 12' channels, and agitation is provided by two 60" diam. four-blade rubber-covered agitators driven at 98 rpm to 60 hp. motors.

The washed stock is regulated and pumped to the third floor which is given over entirely to rifflers. The rifflers, consist of eight channels 7' 7" wide by 86' long and are provided with slotted tubes to accommodate 3" x 8" baffles on 3' 0" centers. Riffler mix-box and rifflers are constructed entirely of block tile. The stock is diluted with decker white-water to 0.45 per cent moisture free consistency and flows over rifflers at approximately 50 fpm.

The area alloted to riffling amounts to approximately 20 sq. ft. per ton of production. Riffled stock discharges to an end flume which delivers the stock to the screening equipment on the floor below.

The second floor contains all screening equipment. Riffled stock is screened on four Waterous 42" Quillers with .055" perforated plates. Accepted stock is re-screened on sixteen 16-plate Sherbrooke flat screens, with the arrangement being eight lines of two screens each. These screens are fitted with chromium-plated screen plates having .008" and .007" slots. Tailings from the flat screens are re-screened on a single line of two 16-plate Sherbrooke flat screens with .007" and .006" cut plates. Accepted stock from all the flat screens flows to deckers on the main floor where it is thickened and discharged to a stock chest, similar to the washed stock chest, and having a capacity of about 30 tons a.d. at 3.0 per cent.

Rejects from the rotary and flat screens are weired and pumped to two Waterous 42" Quillers, the accepted stock from which will go to news machines. Rejects from these screens will be re-screened on two lines of two 16-plate Sherbrooke flat screens, the accepted stock being recirculated and the rejects going to the refiners.

Knotter rejects are treated in a Jeffrey shredder and combined with the screen-rejects before going to two old Sturtevant rock emery refiners. Refined stock is screened on a single screen and sent to wet machines, the rejects being recirculated.

Consistency regulators have been installed to regulate the stock to the rifflers and also from the screened stock storage chest. These are of the air-bubble type with Foxboro instruments. Ample weirs have been provided for measurement of stock flows at all important points, and liquid level recorders have been grouped on a central panel on the main floor for ease of inspection and maintenance.

All stock chests and flow channels are tile lined. All stock lines are lithcoted. Rifflers and mixing boxes are of block tile. All metal parts in contact with the stock are rubber-covered or lithcoted.

At full production of 250 tons a.d. per day, approximately 100 tons a.d. will be by-passed to the news mills. This stock will be mainly rotary and flat screen rejects from the sales sulphite side plus sufficient makeup direct from the rifflers. All sales sulphite will be accepted by the flat screens having been double screened over rotaries and flats.

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Pacific Coast Pulpwoods*

R. S. HATCH[1] and W. F. HOLZER[2]

The timber stands in the Pacific Northwest have made it one of the principal pulp producing regions in the country, and the favorable growth rate of the forests, if properly managed, can enable the region to maintain its position.

The forests are dominated by a relatively few species of conifers. There are very few deciduous trees available in commercial quantities, and these are practically negligible in comparison to the total wood stands.

While the pulp industry on the Pacific Coast is one of the largest in the country, it still uses far less wood than the lumbering operations of the region. In the past the two industries have complemented each other by using different species. The lumber mills confined their operations largely to Douglas fir, while the pulp mills maintained a balance by using other species such as western hemlock, white fir, and Sitka spruce, which the lumber mills rejected. During the war, however, the unusual demand for lumber, together with the shortage of labor and increasing scarcity of easily available timber for sawlogs forced the sawmills to use any log of suitable quality, regardless of species. This, in turn, curtailed the pulpwood supply at a time when demand for pulp was the greatest in history, and forced the pulp mills to use any available log almost regardless of species and quality.

The emergency forced practices on the mills which they would have been reluctant to adopt otherwise, and demonstrated how the two industries, lumber and pulp, could work together even more closely to utilize more completely the existing stands and future growth of the forests of the region more efficiently.

This is particularly true in the case of Douglas fir. The pulp and paper mills, except for minor amounts used in board, had avoided using this species, almost entirely, because they considered it unsuitable for pulping. First, it cannot be pulped by calcium base sulphite process. Second, the fibers are coarse. Third, the prejudice of paper men for high bursting strength has been an effective barrier against the use of this low bursting strength pulp in spite of its exceptionally high tearing resistance. The reconciliation of the papermakers to its weaknesses, at least in part, and its introduction as a major pulpwood has been one of the principal changes in the Pacific Coast pulp industry during the war.

General Characteristics of Western Pulps

It may usually be demonstrated that pulps of a region have certain properties in common regardless of the species from which they come. This probably stems from the fact that pulping processes are subtractive, and cannot impart properties to pulp not present in the wood originally. Then, with general growing conditions similar for a fairly large area, and with certain species best adapted to those conditions, the similarity of the pulps seems a logical result.

The inherent characteristics of western pulps attributable to the wood are several in number.

(1) The pulp fibers are large in size. Average filter lengths from western woods range from about 3.5 to 5 millimeters, and average fiber widths range from 35 to 45 microns. These dimensions, both length and diameter, are appreciably greater than dimensions of fibers from other regions with possible exception of southern pine. The fiber size contributes to the good strength of western pulps, especially the oustanding tearing resistance. The large fibers also tend to make the papers made from them both bulky and porous. This may or may not be an advantage depending on the grade of paper and its use.

(2) In refining, there is a definite tendency for western pulps to be more resistant to treatment, and to fibrillate more than pulps from other regions. Until the need for more severe treatment was recognized, these pulps were considered inferior, but now with proper refining their excellent

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(*) Abridgment of paper presented at the fall meeting of the Technical Association of the Pulp and Paper Industry held in Detroit, Mich., September 26-28, 1946.

strength is well known. Chemically, the pulps have lower pentosan and higher alpha-cellulose contents than those of eastern pulps, and this type of chemical composition has been correlated empiracally with slow rate of development under physical refining.

(3) Western woods contain a greater amount of natural organic dyestuffs than most pulpwoods from other regions. In one case at least, the nature and amount of such a dyestuff is believed to inhibit the sulphite pulping of the wood. In other species the amounts of these materials are great enough only to interfere with the color of the pulps, and possibly the bleaching of them.

Species Commonly Used for Pulpwood

Western Hemlock (*Tsuga heterophylla*)

Western hemlock is the best all-around pulpwood in the region, and one of the best in the world. The wood is of good density, can be pulped by any process, and gives pulp yields as high as any species in the region and higher than most. The pulps have excellent strength, both sulphite and kraft, and are well balanced as regards bursting strength and tear. The unbleached pulps tend to be dark on the reddish side, but they offer no resistance to bleaching. The pulping of this species and the evaluation of the resulting pulps has been the subject of a number of papers. (*1*)—(*14*).

The White Firs (*Abies grandis, A. amabilis, A. nobilis*)

These are the true firs of the botanist. They are best treated as a group since neither the wood of the various species in chip form, nor the pulps are distinguishable from each other. The firs are classed as excellent pulpwoods, only slightly less desirable than hemlock. Using hemlock as a standard, the following comparisons may be drawn: White firs may be pulped by any process, and give comparable yields on a weight basis. However, the density is about 5 per cent lower on the average, and digester charges are reduced by that amount. Pulp strengths are to the order of 5 per cent lower, but the good balance between burst and tear is maintained. Pulp color is usually better, and pulps are readily bleached.

Sitka Spruce (*Picea sitchensis*)

Sitka spruce is a very good pulpwood, but it is also highly prized in special applications in lumber such as airplane spruce, boxes for food products, etc. This species is not as high in quality for chemical pulping as those preceding. Again using lock as a standard, the following comparisons may be made: Spruce can be pulped by any process, and gives as good yields. Density of the wood is usually over 5 per cent lower, and reduces digester yields by that much. Pulp strengths are to the order of 10 per cent lower. Pulp color is probably the highest of any species. In fact, because of the good color of the wood and the relatively limited stands of the species, it is usually reserved for groundwood. Strangely enough, while its chemical pulps have the lowest strength of the common pulpwoods, its groundwood has the highest.

Species Less Commonly Used for Pulpwoods

In this group are included the species used in lesser quantities because of smaller volume of supply, or not used at all for any of several reasons, such as lack of stands of significant size or inaccessibility of existing stands.

Western Red Cedar (*Thuja plicata*)

Western red cedar might be called a specialty wood. It is one of the minor species in the region, and is found as a rule scattered in stands of other species. It is in demand for the manufacture of shingles because of the durability of the heartwood. Only low quality logs or small ones find their way to the pulp mill, and these in only insignificant quantity.

Cedar is pulped only by the kraft process since it reduces with difficulty by sulphite and gives dark colored pulps. This wood has a high water solubility, to the order of 8 per cent, and a high lignin content which ranges from 29-32 per cent instead of the usual range of 26-30 per cent found in most softwoods. Both of these properties have an adverse effect on pulp yield. In addition, the wood is low in density, usually 10 per cent or more lighter than hemlock. This further reduces production by decreasing digester charge.

On the other hand, the pulp from cedar develops the highest bursting strength of any species in the region. Also, the fibers are finer and shorter, so that they form exceptionally well on the paper machine.

Lodgepole Pine (*Pinus contorta*)

Lodgepole pine is a minor species in the principal pulp producing region in Oregon and Washington, in fact, it is almost unknown west of the Cascades except as a scrubby, non-commercial tree along the coast. The largest stands are in Montana where a pulp mill is projected, and from where small quantities are being shipped to the Great Lakes region.

As is the general case of pines, this species is not readily reduced in the sulphite digester, and its use is confined to the kraft process. It will produce a good pulp that has better than usual forming characteristics on the paper machine.

Mountain Hemlock (*Tsuga mertensiana*)

Mountain hemlock is found in Oregon and Washington in limited areas of the Cascade range, usually above 3,500 feet elevation, and has found little application, because of its general inaccessibility. Experimental work has shown that it pulps readily by the sulphite process, but is inferior to western hemlock in density, yield, and strength, both burst and tear. No data are available for the kraft process, but it would be expected that those results would parallel the ones for sulphite.

Pulpwoods in California

The timber stands in California are not as extensive as they are in Oregon and Washington. Then, too, the principal species are ponderosa, and sugar pines, both of which are highly prized as lumber trees, and, as such, are too valuable for pulp. In addition, there are no rivers close to the timber stands large enough to support a pulp mill. These have been deterring factors to the establishment of a pulp industry in California

Red Fir (*Abies magnifica*)

Red fir can be pulped by either the acid or alkaline process, but much more easily by the latter. The wood, like most grown at higher altitudes, is fairly low in density, but gives a good yield. Burst-

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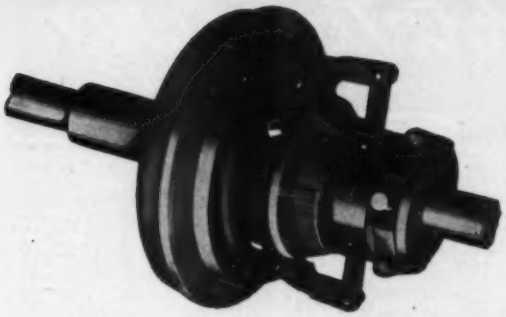

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ing strength is good, but tearing resistance is low by Pacific Northwest standards.

White Fir *(Abies concolor)*

This species of white fir is found along with red fir, and is somewhat similar in properties. It pulps more readily by the sulphite process than does red fir. Wood density is fairly low, but pulp yields are good.

Sugar Pine *(Pinus lambertiana)* and Ponderosa Pine *(Pinus ponderosa)*

These two pines are most abundant in the northern half of California and the southern half of Oregon, but the known range, especially for ponderosa pine, extends several hundred miles on either side of the one described. As already mentioned, their value in lumber has kept them from being used for pulp although sawmill waste is a potential source of pulpwood. They can be reduced only in the kraft process, and produce a pulp in fairly good yield, but only fair strength.

Redwood *(Sequoia sempervirens)*

The famous redwood is used for lumber, but as yet has found no use in pulp. The wood is low in density, and has an extremely high water soluble fraction. These factors cause a low pulp yield, to the order of 35 per cent instead of the range of 45 per cent expected of a good pulpwood. The fibers are the longest of any wood fiber in this country and probably in the world. Pulp strengths are low in burst, but good in tear.

Pulpwoods in British Columbia and Alaska

The pulpwood species in British Columbia and Alaska are the same as found in Oregon and Washington. The make-up of the forests, however, is somewhat different. Douglas fir decreases as we go north, and hemlock becomes the dominant species with spruce more abundant than further south. The trees are not as large, except for some of the choice stands of spruce on some of the coastal islands, and tend to be lower grade logs suited primarily for pulpwood.

Both commercial practice and experimental work have shown that these woods are equivalent to the same species in Oregon and Washington.

Douglas Fir

Wood Properties

The sapwood is whitish to pale yellowish or reddish, and the heartwood ranges from pale reddish yellow to deep orange and red. Growth rings are conspicuous and characteristic. Springwood is soft and usually several times wider than summerwood. The transition is abrupt. The summerwood is hard, and ranges from very thin in old slow growth to quite thick in rapid growth. This growth characteristic gives rise to uneven texture, and, as regards pulp, two distinct types of fiber.

Springwood fibers are very large in diameter (up to 55 microns), fairly thin-walled, and have characteristic spiral thickenings on the interior. Summerwood fibers are much narrower, and have very thick walls with very narrow lumens.

The average length of the unbroken tracheids has been variously reported from less than 3 to 4.5 mm. The latter is probably more nearly the true value. While the average fiber length of Douglas fir is in the range of 4 to 5 mm., an appreciable percentage of the fibers attain a length of 7 mm. and more. This is characteristic of the species and the extreme fiber lengths are surpassed only by those of redwood.

Grades of Douglas Fir Wood

The various growth types of Douglas fir have given rise to commercial names that are confusing and often contradictory. A young tree is known as a "sap fir." The early growth is very rapid and coarse, and the heartwood is red in color giving rise to the name "red fir" In maturity, growth is slower, and texture becomes fine and even-grained. This is the prized "yellow fir" of the lumberman. Claims have been made that the different types are different species, but they may all be found in a single tree. Again the coarse texture and reddish color may persist well into maturity producing the less desirable red fir. The reasons for the variation in growth have not been satisfactorily explained. Be that as it may, it is unfortunate that such confusing nomenclature is in common use.

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Quality of Douglas Fir Pulp

Since Douglas fir is pulped commercially only by the kraft process, pulps from that process only need be considered.

The large fibers typical of western pulps reach their greatest size in Douglas fir. This determines several properties of the pulp. In handling it is necessary to use larger openings in the screen-plates, usually by about 25 per cent. The pulp is quite free, and because of its good drainage on the wire, it requires more water in the headbox. The large fibers make the sheet more porous, and, therefore, easier drying, but they also make the paper bulky and low in finish. Douglas fir pulp has unusual strength properties. It has outstanding tearing resistance and a low bursting strength. As remarked previously, the tendency, or rather practice, of papermakers has been to insist on bursting strength to the exclusion of other qualities, and to condemn a pulp deficient in this quality.

The color of the unbleached pulp is darker than that of pulps from other species. It can be lightened by reduction type bleaches. The pulp can be bleached to high whites, but not as readily as pulps from hemlock.

The Sulphite Pulping of Douglas Fir

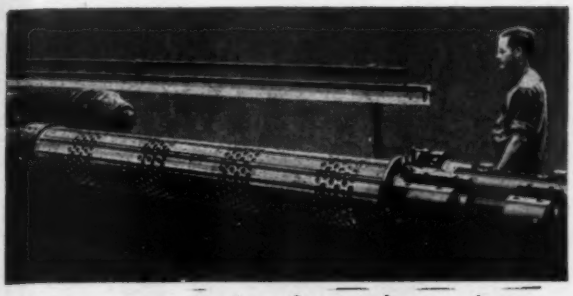
It is a well-known fact that the heartwood of Douglas fir is not pulped by the conventional sulphite process. Using a calcium base acid, the base precipitates suddenly toward the end of the cook, making it necessary to blow the charge quickly to prevent burning. This results in pulps with from 10-30 per cent screenings. The use of a soluble base, such as sodium or ammonium, permits the cook to be completed, but the cooking cycle must be drastically increased, either time or maximum temperature, or both.

Several laboratories have proposed means of pulping Douglas fir by the sulphite process, but no results to date could be considered safe for commercial application without a soluble base, and this introduces economic complications. Benson and co-workers [35, 36, 37] were pioneers in the field of sulphite pulping of Douglas fir, suggesting a pre-extraction with ammonia, or an ammonia base liquor. Successful pulpings have been made, but the cost of ammonia until the past year has made commercial applications impractical. Brookbank[38] approached the problem from the standpoint of fitting the cooking cycle to the wood. He attributes the precipitation of calcium base liquor to the possibility that Douglas fir does not raise the precipitation temperature of the liquor as much as other species do, or that certain pinene derivatives in Douglas fir interfere. For best results he recommends an acid with a high free sulphur dioxide, a low maximum temperature, and a cycle with a longer than usual impregnation time, and a long time in raising temperature from 110 C. to maximum. Chidester and McGovern[39, 40] have had good results along the same lines as Brookbank. In addition, they have made extensive studies with various bases and class their results almost directly in proportion to the solubility of the base, that is, calcium poor, magnesium fair, sodium good. Addition of small percentages of sodium to calcium base acid improved results out of proportion to the amounts added. They call attention to the similarity in behavior of Douglas fir and pines in the sulphite digester and cite the work of Erdtman[25] on the latter in which the difficulty of pulping pine was proved to be caused by pinosylvan, a hydroxyphenolic compound. Work along these lines is under way at Forest Products Laboratory, and should be a valuable contribution to the field.

Douglas fir sapwood can be cooked without serious difficulty. However, as in the case of heartwood, the pulp is olive green in color when wet, and light brown on drying. Bursting strength is below that of hemlock to the same or greater extent than in kraft pulps, and tearing strength is only slightly higher than hemlock sulphite pulps. Unless the high alpha-cellulose content of Douglas fir proves of interest to manufacturers of dissolving pulps, the sulphite pulping of this species appears to be inadvisable in view of the difficulties in the digester and the quality of the pulp.

The Sulphate Pulping of Douglas Fir

Pulping of Douglas fir by the sulphate process presents no particular problem. A study of the effect of varying the conditions of the cook on the properties of the resulting pulp has been made at Forest Products Laboratory. Bray and Curran[23] reported on the effect of chemical con-



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centration. To obtain the maximum cellulose yield with a high degree of delignification, the use of low chemical concentration is indicated. Bray, Martin, and Schwartz[25] found that increase of sulphidity improved the delignification and improved the properties of the pulp up to about 34 per cent. Above this sulphidity no further change was noted. The work was done with a constant amount of active caustic soda. Bray, Martin, and Schwartz[26] also made a study of the variation of pulp properties with wood quality. Samples of old and young wood, both rapid and slow growth, were cooked. Tearing resistance was best in rapid growth, and tensile best in slow growth wood. Bursting strength was highest in young wood or near the top of the tree in older growth, and tear was opposite in trend, as is the usual case. Martin and Bray[28] found that maximum pulp yield was obtained by using 17.5 per cent chemical on the dryweight of wood. On increasing the chemical to 25 per cent there was a sharp drop in yield, but thereafter yield was practically constant. There was very little change in strength or rate of beating of pulps with increase in chemical concentration. Wilkie[29] summarized a large number of mill data and found that under approximately constant conditions, there was an optimum bleachability for maximum bursting strength with decrease of strength on both sides of the optimum. Tear was found to decrease as bleachability decreased. There was little change in strength with decreasing sulphidity until a critical minimum was reached, and thereafter strength decreased. Haffner and Kobe[27] claimed to have made an exceptionally strong and bleachable pulp from Douglas fir by use of sodium sulphite cooking liquor adjusted to a *p*H of 9.6 with caustic soda.

The published experimental work may be summarized by saying that the cooking variables of the sulphate process affect the qualities of Douglas fir pulp in a manner similar to the pulps from other woods.

Economic Aspects of Western Pulpwoods

The pulp industry, when it was first established in the Pacific Northwest, selected as raw materials those species of wood which were of little value as raw material for the manufacture of lumber. These species are West Coast hemlock (*Tsuga heterophylla*) and the true firs including *Abies grandis, Abies nobilis, Abies concolor* and *Abies amabalis*. Hemlock and the firs are characterized by a low pitch content and are readily pulped by the sulphite process. It was, therefore, natural that these woods should form the basic raw material for a large scale sulphate industry.

As the kraft process began to expand, western hemlock served originally as the raw material and a considerable amount of western hemlock kraft is now being produced on the west coast. Douglas fir was used only to a limited extent and Douglas fir kraft was considered to be an inferior pulp suited mainly for the production of board. The increase of the use of Douglas fir in the past five years through necessity has been discussed, as well as the morphology of Douglas fir and the character of pulp which may be produced from this species. It has been demonstrated that Douglas fir kraft may be bleached by proper methods to a brightness fully equal to bleached kraft pulps made from other species and that this bleached pulp possesses unique papermaking properties on account of its high tearing strength and high folding endurance.

It is hardly within the scope of this discussion to go into detail as to the amount of Douglas fir available in the Pacific Northwest for the production of sulphate pulp. Douglas fir sawmill waste and cull logs left in the woods as a result of our large scale logging operations have received much attention from various authorities who have studied this problem in a very exhaustive manner.

Allen H. Hodgson[30] has reported on quantities and utilization of sawmill waste. The same author[30] has discussed the type and availability of logging waste. Grondal[30] has likewise made a study of logging waste and has proposed methods of preparing this waste for pulp mills[31].

The studies made by the above mentioned authors, as well as investigations made by private timber owners, indicate that there is approximately twenty-five cords of sound wood per acre left on the ground after a logging operation. Logging

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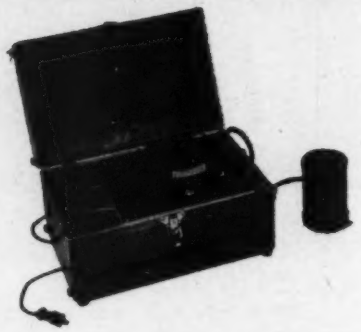

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methods which have been developed on the Pacific Coast for taking out heavy saw timber are not at all suited to re-logging this waste material. Previous attempts to salvage this waste material with the logging equipment used for primary logging have demonstrated the unprofitable character of this method. Up until the pulp industry was established on the west coast, saw timber was the main concern of the operators; consequently, little effort was made to salvage the material left on the ground because of the high cost when operating with regular equipment. At present, there are indications that means will be found to bring out this waste material at costs below the figures shown when using the customary west coast logging equipment.

If a reasonably successful clean-up can be made of the forest floor after a logging operation, the point may be reached eventually where it will not be necessary to do slash burning, which is at present required by law. If slash burning can be avoided, it has been estimated that reproduction will be advanced by fully ten years, since slash burning always delays the germination of seed.

If fires are kept out of second growth timber, development is rapid but growth rate may be greatly increased by proper methods of thinning. The thinning of second growth timber, however, presents engineering problems for the logger which are probably fully as complex as those involving the re-logging of cut over areas. New equipment and new logging engineering methods must be developed before the thinning of second growth stands can be economically justified. When this condition is realized, the industry will have available an appreciable quantity of young, sound wood readily handled by the pulp mills.

During the past 15 years, timber owners in the Pacific Northwest have gone into intensive forest management with the view of maintaining a sustained yield from the forest, protecting their heavy investments in mills and processing plants as well as furnishing continuous employment for those engaged in the industry. The growing of timber under the proper conditions of forest management and protection from fire is gradually being organized as an agricultural cycle in which a crop may be considered to mature in 80 to 100 years under the favorable rainfall and soil conditions existing west of the Cascade summit.

When we have developed the required technique of forest management, a substantially perpetual supply of west coast timber species may be expected. As means are found to clean up the logging waste formerly left in the forest to be burned as slash, and utilize the sound wood for pulp production, a great step forward will have been made in the conservation of our forest resources.

The Weyerhaeuser Timber Company is engaged in converting their sulphite mill at Longview from calcium base to magnesium base and will evaporate and burn the sulphite waste liquor in suitably constructed boilers for the recovery of steam and power, at the same time recovering the magnesium and sulphur in the form of magnesium bisulphite or reclaimed cooking acid. At the present time, the sulphite mill at Longview draws its steam and power from the lumber division power plant which burns hogged Douglas fir waste under its boilers. When the sulphite recovery plant is completed, the fuel now burned for the generation of steam and power for the sulphite mill will be released for other purposes. It is expected that the steam and power generated in the burning of the sulphite waste liquor will render the sulphite mill substantially self-sustaining as far as steam and power are concerned. The sawmill waste which is presently hogged and burned in the sawmill boiler plant to supply the sulphite mill with steam and power may be utilized for the manufacture of pulp.

Exhaustive tests of the sawmill waste available, to which, of course, is added the waste saved by the installation of the waste liquor recovery plant, are the bases for the erection of a 200-ton bleached sulphite mill using Douglas fir sawmill waste as a raw material.

In the past, Douglas fir sawmill waste has been used largely for the generation of steam and power. When it is used for this purpose, the cellulose as well as the non-cellulose portion of the wood is burned. The utilization of Douglas fir as a source of kraft pulp will still leave fully 50 per cent of the organic material

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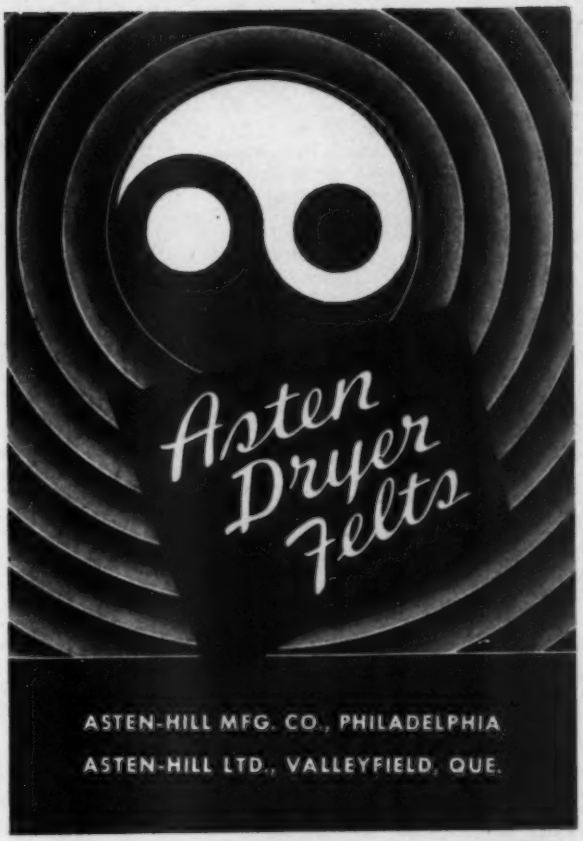

in the wood for the generation of steam and power and will extract the more valuable cellulose for our expanding cellulose consuming industry.

While it is possible to recover cellulose from sawmill waste in an integrated operation, it is important to emphasize that this is not universally feasible. There are many relatively small sawmills in the Pacific Northwest scattered over a wide area. The waste from any one of these individual sawmills is not sufficient to supply enough raw material for an efficient pulp producing unit. Furthermore, the cost of assembling and transporting this waste to some central point would probably be too high to make such practice economically successful. At present, it appears that sawmill waste can be used as a raw material for pulp production only in those larger sawmills equipped with efficient barking equipment and producing sufficient waste, immediately adjacent to a pulp mill of sufficient capacity to assure economical productions.

The conservation of our forest resources is uppermost in the minds of all intelligent timber owners. The integration of lumber and pulp production presents a most interesting example of forest conservation. It must be realized, however, that the accomplishment of more complete utilization of logging and sawmill waste is a long range program, involving the use of new equipment, the combined skills of logging engineers, and mill management as well as the expenditure of large sums of money before a goal will be reached where these wastes can be made economically valuable for better manufacturing use than as fuel for the generation of steam and power.

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Single Dip Plastic Coating

A new liquid Tygon formulation, known as *Tygoflex*, has been announced by the U. S. Stoneware Co., Akron, Ohio, for protecting process equipment such as pipe, valves, fans and rotors, and other intricately shaped equipment. Consisting of 100 per cent solids and containing no volatiles such as water, thinners, solvents, reducers, etc., *Tygoflex*, when applied by the usual techniques of dipping, spraying, brushing, etc., and subsequently subjected

to heat for a short period, converts to a thick, protective insulator resembling in appearance a glossy black rubber compound of medium hardness. Application can be made to any surface or material which will withstand the time and temperature involved in the fusion, such as metals, ceramics, glass, and heat-resistant plastics.

Thicknesses ranging from 1/16 in. to ¼ in. can be built up in a single dip.

The coating is resistant to mineral acids, alkalies, salts, oxidizing agents, and a limited range of solvents. Its upper temperature limits range as high as 250 Fahr.

Electronic Micrometer for Measuring Paper Thickness

Carson Micrometer Corporation, 28 Edison Place, Newark 2, N. J., has announced a re-designed model of its electronic micrometer for measurement

of paper thickness. Designated as Model M, the instrument has a measuring range of ⅛ in.; maximum work capacity of ⅜ in.; depth of throat of 1¾ in.; anvil diameter .060 to 5/16 in. (⅛ in. standard); anvil pressure ¼ oz. to 32 oz. (2 oz. standard). The dial of the instrument is 3 in. in diameter and has 250 divisions. Each dial division is .0001 in.

The instrument when not in use is housed in a cabinet which contains the electronic unit and storage space for instrument attachment cords, spare lamps and tools.

Industrial Adhesive

A new industrial adhesive, 4665 cement, has been announced by E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware. This product, requiring no catalyst or special preparation for use, can be applied, without thinning, by brushing, roller coating, knife coating, or dipping. It contains 27.5 per cent solids.

Although insoluble in water, the bond strength of the adhesive is lowered by continued immersion. However, original bond strength is regained after removal from water.

The dried adhesive film is resistant to dilute alkalis, acids, and corrosive salt solutions.

Paper is one of several fields in which this product is expected to find application.

Water-Treatment Chemical Feeder

Calgon, Inc., 323 Fourth Avenue, Pittsburgh 30, Pa., has announced a new series of chemical feeders by which *Micromet* (a modification of Calgon) can be fed into water lines with simplicity and low cost. The new series consists of feeders holding

up to 20, 50, or 100 pounds of *Micromet* at one charge. The amount of chemical required (dissolving at a rate of approximately 25 per cent per month)—and the size of feeder—depend on the water trouble encountered and the amount of water to be treated. The 50-pound feeder, for example, will handle up to 150,000 gallons of water per month when it is used to control corrosion, up to 300,000 gallons, to prevent lime scale.

New AC Welder

The Lincoln Electric Co., Cleveland 1, Ohio, has announced the new "*Fleet-Arc*" AC welder. Manufactured in 200, 300 and 500 amperage range, the welder is equipped with an arc booster to augment the current the instant the arc is struck. The amount of booster current used in striking the arc is governed by a selector switch which is located on the front of the welder. Current control, continuous and self-adjusting, is provided by a rotating reactor control. A separate power transformer and the adjustable reactor control, according to the manufacturer, enable the "*Fleet-Arc*" AC welder to duplicate the wide range of output of DC welders, and at the same time simplifies the low current welding of thin sheets and increases the welding of heavy plates at high current value.

Take-up for Conveyor Bearing

A steel frame ball bearing take-up for conveyor service has been announced by Dodge Manufacturing Corporation, Mishawaka, Indiana. This take-up incorpo-

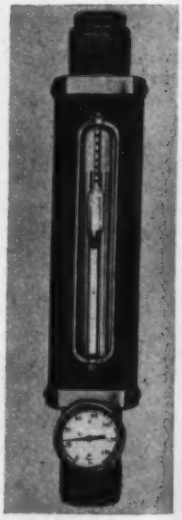
rates the Dodge SC Ball Bearing Take-up unit consisting of a ball bearing inner unit enclosed in a cast iron housing provided with ways on each side for supporting guides. The housing has a hole for receiving the unthreaded end of an adjusting screw.

The frame is of welded construction. Adjusting screw is cadmium plated.

Adjustment is accomplished by turning the brass head nut.

Continuous Specific Gravity Tester

Fischer & Porter Co., Department 1 F-B, Hatboro, Pa., has announced a specific gravity tester designed for continuous indication of fluid specific gravity in closed piping systems. Standard construction includes carbon steel, bronze, stainless steel or Hastelloy. A needle control valve, thermometer, and hydrometer are built into the unit. High visibility of hydrometer and thermometer is claimed.



Two Nickel-Base Corrosion-Resisting Alloys

The Duriron Company, Dayton, Ohio, has announced the development of two new corrosion-resistant metals, Chlorimet No. 2 and Chlorimet No. 3 (Patent Pending).

Chlorimet No. 2 consists primarily of

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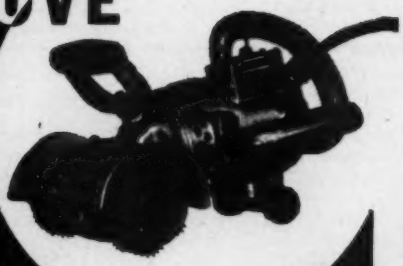

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nickel and molybdenum; Chlorimet No. 3, of nickel, chromium, and molybdenum.

According to the announcement, both of these alloys have excellent mechanical properties and resist the corrosive action of many acids, Chlorimet No. 2 being particularly resistant to hydrochloric acid in all concentrations and temperatures (including boiling), and Chlorimet No. 3, particularly resistant to acids under oxidizing conditions.

Chlorimet No. 2 also is recommended by the manufacturer for sulphuric acid between 60 per cent and 100 per cent, at temperatures not to exceed 175 Fahr. The manufacturer likewise states that Chlorimet No. 3 safely handles hot sulphuric acid solutions in concentrations less than 35 per cent and at temperatures up to 176 Fahr.—it also withstands ammonium chloride, sodium chloride, zinc chloride, nickel chloride and hypochlorite bleaches (at room temperatures not over 105 Fahr.).

Both products are available in the form of engineered equipment such as pumps and valves.

Lightweight Pallet Lift Truck

A 2000-lb. capacity hand pallet truck has been announced by the LYON-Raymond Corporation, 3230 Madison St., Greene, N. Y. Working parts are totally enclosed. High strength alloy sheet steel formed into box sections is used for the

frame; aluminum alloy, for the wheels and other non-structural parts.

Elevation is accomplished through a hydraulic foot pump equipped with relief valve to provent overloading and possible damage. Lowering results from pushing the foot pedal forward.

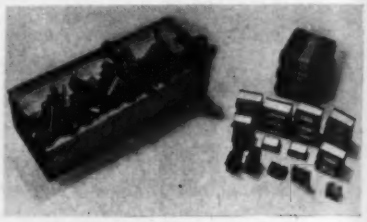
Chemically-Resistant, Fast-Drying Industrial Coating

A corrosion-resistant coating, P-5, has been announced by The Watson-Standard Co., Pittsburgh 12, Pa., for the protection of metal, wood and concrete from exposure to moisture, acids, alkalies, and many other disintegrating elements.

In addition to its chemical resistance, P-5 is free from objectionable paint odors, is non-toxic, and dries by evaporation without requiring an oxidation period. It has good thermal stability, is highly resistant to abrasion and scrubbing and has good aging characteristics. It does not oxidize or become brittle, and is available in nine colors.

Reconditioning Service for Worn-Threading Dies

The Mechanical Arts Company, 4 Orient Way, Rutherford, N. J., has announced a reconditioning and regrinding service for worn threading dies. The work (see illustration) often arriving as a

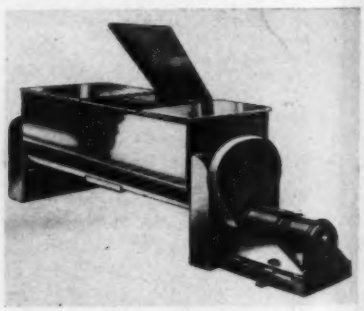


jumble of dull and worn threading dies, is sorted as received. Next, it is cleaned, reground, and carefully reconditioned. Then it is wrapped in sets, in heavy waterproof paper, labeled for identification, and returned to customer by parcel post or express, or by air if so specified.

The service is available on one or any number of dies.

Horizontal Mixers

The H. W. North Company, Erie, Pa., has introduced several types of single and multiple arm horizontal mixers and blenders for the mixing and processing of a wide range of materials—from dry powders to heavy viscous slurries and pastes. Custom-engineered for each individual application for batch, automatic or con-



tinuous operation, the mixers are available in stainless steel or plain steel construction and with mixing chambers jacketed when required for heating or cooling.

Special designs for processing materials under vacuum or pressure also have been developed to meet such service conditions.

Water Soluble Cellulose Gum

Hercules Powder Company, Inc, Wilmington, Delaware, has announced a new water soluble cellulose gum which is designated as CMC. This product, the sodium salt of carboxymethylcellulose, is formed by the reaction of monochloroacetic acid with alkali cellulose.

Of particular interest to the paper industry are two types of CMC: "*Beater*"

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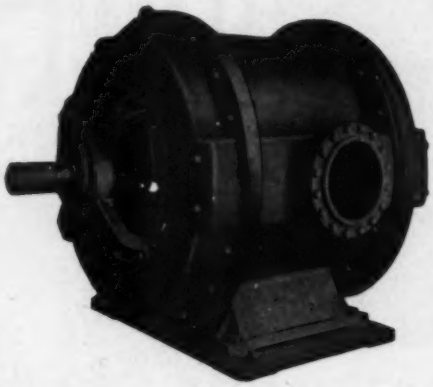

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type, and "*Surface*" type. Both of these items are supplied in white, granular powder form.

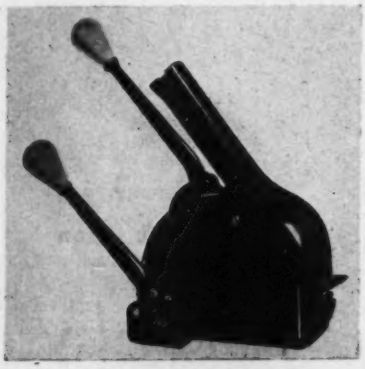
The "Beater" type can be added dry at the beater. It is precipitated readily as the insoluble aluminum salt and improves the strength properties of paper.

The "Surface" type can be added at the calender stack or size press and may be used separately or in conjunction with conventional surface treating materials, such as starch, wax, and wax-resin emulsions. Tests indicate that this material improves the surface characteristics of paper and paperboard—it increases resistance to penetration of gloss inks, waxes and oils.

New Steel Strapping Tool

Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill, has announced the Acme #3 *Steelstrapper* as a faster and lighter weight steel strapping tool.

The tool, weighing 6¾ pounds, has two levers, one for tensioning, the other for sealing and cutting the strap from the coil of strapping.



The sealing lever automatically returns to the starting position after the sealing operation is completed. The seals, which join the two loose ends of strap around the package, are fed automatically from a magazine into the sealer jaws. The sealer holds a clip of 100 seals.

A front rotary stretcher dog provides fast and unlimited tensioning; a positive lift of the rear gripping dog simplifies strap alignment.

The tool is made to handle ¼ in., ⅜ in., ½ in. x 0.10 in. to .020 in. inclusive, both Flat and Tight Edge strap.

Accessory for Abrasion Tester

Taber Instrument Corporation, 111 Goundry St., North Tonawanda, New York, has announced a device, known as Model 100-108 Vacuum Pickup Attachment, for use with the Taber Abraser to remove paper and paperboard abradings from specimen being tested. The unit provides: (1) variable controllable suction; (2) centralized electrical connections for all Taber wear-tearing apparatus, including an interval timer and an illuminated magnifier; and (3) rotative suction nozzle.

A cylindrically-shaped vacuum turbine, horizontally positioned on the floor, is connected to the testing instrument with rubber-covered flexible hose. Suction nozzle assembly is mounted on the right-hand arm support of the instrument; rotative nozzle is easily adjusted to proper height as determined by thickness of specimen for continuously removing abradings from the circular abrasion track worn on the surface of the test sample by the revolving abrasive-embedded wheels.

The attachment, equipped with a Powerstat Regulator, operates on 115v-50/60 cycle current. It also is adaptable to 230v-50/60 cycle operation with the use of a supplementary 750-watt stepdown transformer.

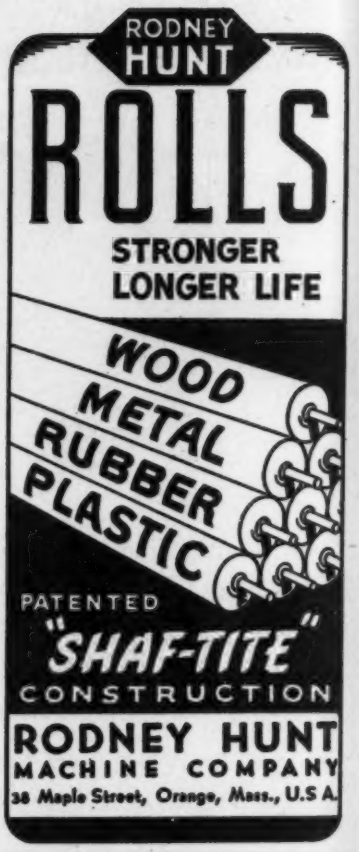
Linear Speed Meter

A direct reading, linear speed meter, designated as Type 25D, has been announced by the Metron Instrument Co., 432 Lincoln St., Denver 9, Colo. Usually supplied as a single range instrument, it is available in a selection of speed ranges from 10 to 10,000 feet (or 3 to 3,000 yards) per minute. Contact to the moving member is made with a replaceable free running disc 3⅞ inches in diameter.

The disc, the contact surface of which is of oil resistant synthetic rubber, is clamped on the rotating shaft of the head. Lubrication of the head is permanent. The instrument is of the electric type.

2,4-D Weed Killer

A new liquid, 2,4-D compound, designated as Knox-Out Weeds Liquid, has been announced by the Pennsylvania Salt Manufacturing Company, 1000 Widener Bldg., Philadelphia 7, Pa. According to the announcement, one pint of the liquid weed killer, mixed in 20 gallons of water, will effectively treat 4,000 square feet of planted surface. When applied as a coarse spray in water, it is absorbed by broad leafed weeds and taken into their root systems, killing the plants in from one week to a month.



The new product will be sold in addition to Knox-Out Weeds, the powdered form of 2,4-D, introduced previously.

Water-Fog Equipment for Fire-Fighting

Bowser, Inc., Fort Wayne, Indiana, has announced a device, designated as Figure 1030, as an item of Underwriters' approved fire equipment. The unit connects directly to a water line. A swing joint mounting makes it possible for the fixture to turn in alignment with direction of the hose pull. A 50-ft. length of ¾ in. high pressure hose is racked in figure 8 position for fast removal without kinking.

The nozzle supplies finely atomized water with medium pressures as normally provided by city water systems. Laboratory tests report a 20 ft. fog projection at 50 lb. nozzle pressure with a gallonage discharge of 15.9 per minute. At 75 lb. nozzle pressure, the projection is increased to 25 ft. with a gallonage discharge of 19.3 per minute.

According to the announcement, water fog has the ability to dilute vapors, washing the air so that it reduces the hazard of an operator being overcome by gas or smoke.

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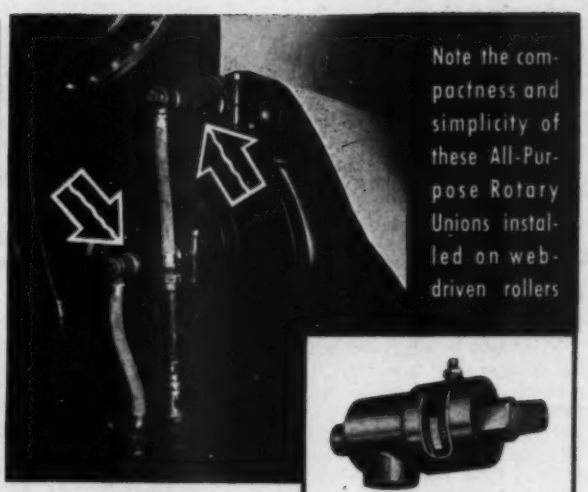

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TECHNICAL DEVELOPMENTS

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Factors That Influence Rosin Sizing

Sizing may be influenced by the following factors: (a) those due to the raw materials, (b) those which become manifest in the fibrous mixture (in the beater), and (c) those that appear later in the course of the manufacture of the paper. Each of these is discussed critically from the standpoint of the technologist and the practical papermaker. The quality of the rosin used is important. An intermediate color grade ("F" or "G") is preferred, although darker grades may be used when the color of the paper is of minor importance. However, the cheaper grades contain more unsaponifiables, which may give rise to deposits.

Rosins, darkened by long exposure to air or light, are oxidized and militate against good sizing. On storage, large pieces of rosin are more stable than is powdered rosin, and the most stable rosins are those that have been prepared at 200-270 deg. C. In the preparation of rosin size, sodium carbonate gives better emulsions than does sodium hydroxide. The addition of protective colloids (like sodium silicate) may be used in stabilizing such emulsions. In general the best results are obtained with sizes containing not over 40% rosin. To prevent oxidation small amounts of reducing substances like sulphites may be added. The optimum temperature range for forming rosin size is 102-105 deg. C., and when caustic soda is used the best concentration of alkali is about 10 deg. Bé. The best temperature for dispersing the rosin size in water is about 67 deg. C. Aeration lowers the quality of the rosin size due to oxidation and sudden chilling should be avoided.

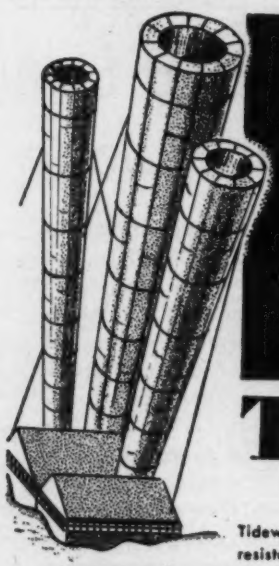
The color of rosin size milk is independent of the color of the original rosin, but depends on the particle size of the dispersed phase. When the particles are extremely small, the emulsion gives a bluish fluorescence and the mixture is watery. In fact a suspension with high free rosin content may be so transparent that only the Tyndall effect will show the presence of colloidal particles. Precipitating agents (notably papermakers alum) are discussed. Small amounts of insoluble material in the alum simply act as fillers. However the free acid content of the alum must not exceed 0.5%, especially when white water is recovered and utilized. Ferric salts in the alum, which affect the color of the finished products must be kept at a minimum. The Fe_2O_3 content in alum should be kept below 1% in newsprint, below 0.3% in ordinary writing and book papers, and below 0.1% in quality papers.

The water used in diluting rosin soaps is important; permanent hardness being more serious than temporary hardness. "Neutral size" is usually more affected by hard water than is 40% free rosin size. It is best to use water from condensed steam or softened water in making up size solutions. Mechanical and unbleached sulphite pulps absorb rosin size most readily. Rag stock is sized with difficulty and the time of contact between the stock and the sizing agent becomes an important factor. Pulps containing less than 4.5% pentosans are difficult to size. The mineral content of the pulp may also influence the degree of sizing.

The advantages of combining alum with sodium aluminate are discussed together with the *p*H. In general such a combination of precipitants diminshes the rate of aging of the finished sheet, conserves papermachine felts and wires and permits good sizing in the presence of loading materials like $CaCO_3$. It also allows a better retention of fillers on the wire and in general speeds up the beating operation because of lowered acidity of the white waters. In using aluminate, its free alkali content should be neutralized in the beater by the acid freed by the alum. The lower the free alkali content of the aluminate, the less alum need be used. Provided the aluminate is used alone, the alkali may also be neutralized by the addition of a mineral acid. The iron content of the aluminate should be no higher than that of the alum.

Experiments indicate that, in the case of a bleached sulphite pulp beaten in a Lampen mill, the degree of sizing increases with increasing degree Schopper-Riegler (S.R.) even in the complete absence of rosin size or of alum. Here the sizing is actually effected by the pulp slime alone. When this same pulp was used with 1% rosin size at *p*H 5 the same qualitative effect was noted; the degree of sizing however was greater than with the pulp alone. In other words, both the slime and the rosin cause a sizing effect, which however is not additive.

In a third set of experiments, it was shown that the higher the degree of beating (S-R), the less rosin was required to reach a satisfactory degree of sizing. Whereas 4% rosin added to pulp beaten to 20 deg. S-R gave a degree of sizing of only 37, as little as 0.5% rosin added to this same pulp, beaten to 80 deg. S-R, gave a degree of sizing of 280. The temperature of the pulp in the beater, especially when it makes contact with the rosin size, is critical. The author showed that in the case of a kraft pulp beaten to 30



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deg. S-R, and sized with 4% rosin and a definite amount of alum, the degrees of sizing at 20, 45, 60 and 70 deg. C. respectfully were 23, 5, 1 and zero. In general, the temperature of the pulp should not exceed 35 deg. C. Means of attaining this in practice are outlined. Rosin adsorption is at its optimum when pulp density is about 5%. The influence of dilution of the size milk and of the alum and sodium aluminate on the degree of sizing is outlined, the most satisfactory concentration being 25 g. total rosin per liter.

Solid alum is less favorable to sizing than is an alum solution. No universal optimum *p*H can be given. Variations from *p*H 4 to 6.5 may obtain depending on conditions. The *p*H should be determined not in the beater but in the headbox of the paper machine, where the *p*H may vary markedly from that in the beater. When the acidity of the stock is regulated (after sizing) by means of alum, the best *p*H is usually 5. When sodium aluminate replaces alum in part or entirely, *p*H 6.5 appears to be effective. Before adding the size, the stock should be neutral or slightly alkaline. Localized rosin precipitation occurs if the original stock is acid, and sizing is impaired. If the stock is "desized" by long standing (as in the case of a mill shutdown) restored sizing can be effected by the addition of more alum or by slight heating in the headbox. However, the *p*H should always be closely regulated.

The optimum ratio of rosin to aluminum varies and is contingent on the *p*H. Two-stage sizing is discussed. It is advantageous only when the initial rosin used was relatively low (0.5-1.5%), and when the stock was not "saturated with rosin" in the first stage. Recovered white waters should first be neutralized with sodium aluminate or sodium silicate. The effect of loading materials on sizing is discussed. Whereas such fillers as gypsum and talc may improve sizing, most others effect sizing adversely.

In charging the beater, the stock (together with sodium aluminate if this is used) is added first, followed, after hydration, by the rosin size, and 30 minutes later by alum. Fillers are added 15 minutes thereafter. If high retention of expensive fillers like TiO_2 is required, these should be added directly after the addition of the stock. The succession of charges is discussed at some length.

The mode in which the rosin is retained in the paper is also discussed and varying points of view are brought into harmony. Changes in stock density in the headbox, refining of the pulp, and heating the stock after sizing, have no significant effect on the degree of sizing. However, the temperature at which the sheet is finally dried is important and dryers should be so regulated that the sheet coming in contact with a drying cylinder at the so-called "critical temperature" should not contain over 50% water. This temperature must be determined for each paper machine and also for each type of paper made. Progressive drying is important. Sharp fluctuations in temperature are to be avoided. It is suggested that 2/3 of the drying cylinders be kept below the critical temperature. High speed machines may cause a recession in the degree of sizing.

Usually drying cylinders of large diameter result in better sizing than do small ones. Calendering has a decidedly adverse effect on sizing, which varies with the composition, beating and basis weight of the paper. Before a paper is calendered, it should show a degree of sizing actually in *excess* of that required in the final sheet. Sheets that have been friction-calendered also suffer loss in sizing properties.

The degree of sizing varies inversely with the basis weight. When the acid-containing white water from groundwood is used in a sizing operation, the degree of sizing drops. Apparently the alum action is weakened. Such white waters are very rich in colloidal matter and should be neutralized with aluminate or sodium silicate prior to reuse. Although sizing may improve when paper is stored at a high relative humidity of 80 to 100%, this is not the case at 30-70% R.H. The strength properties of a sheet are affected adversely as a result of sizing. The author gives data on five papers (sized and unsized), in which burst, breaking length, and tear were all higher in the unsized controls. Sizing also has a bad effect on permanence of the paper sheet. Twenty-one references are given. P. Goldsmid. *Papeterie* 68, 293-6, 330-3, 362-3, 265-6 (1946); 69, 2-3, 5-7, 9, 70-1 and 73 (1947). (In French.)

WITH an enviable record of achievement behind us, and mindful of important responsibilities of the present and future, Warren enters its fiftieth year in business. Tomorrow's pumps will be better than today's. . . and to this advance Warren will make important contributions, just as it has in the past. ★ The entire Warren organization has the background, the facilities and the determination to serve you. It will continue to do so faithfully and well.

WARREN STEAM PUMP COMPANY, INC.
WARREN, MASSACHUSETTS

WARREN PUMPS

PP8½

1897 - OUR FIFTIETH ANNIVERSARY - 1947

New Catalogues and Publications

American Standards Association, 70 E. 45th St., New York 17, N. Y.—A 20-page booklet now available to safety engineers, legislators, and others, contains a list of approximately 200 standards covering safety and industrial health. A brief description of each standard is given to make it easier to locate standards in any special field. Ask for Booklet PM87.

Babcock & Wilcox Company, 85 Liberty St., New York 1, N. Y.—Of interest to those concerned with the handling of alkaline solutions, paper mill black liquors, liquefied gases and other low temperature media, as well as mildly acidic conditions, is a 10-page, illustrated bulletin just issued by this company. The booklet describes the mechanical and working characteristics, heat treating behavior, and weldability of the newly developed nine per cent nickel steel tubing which is one of the company's products. Ask the Advertising Division for Bulletin No. TR-508.

Brown Instrument Company, Wayne & Roberts Aves., Philadelphia 44, Pa.—Recently published by this company, which is a division of Minneapolis-Honeywell Regulator Co., is Catalogue No. 8302, "Industrial Control Devices." This booklet contains useful information on electric and pneumatic automatic control systems, with schematic diagrams, dimensional drawings, and photographs of the instruments, as well as specifications, range charts, etc. Copies on request.

Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J.—Now available as Calco Technical Bulletin No. 792 is the paper, "The Dyeometer: an Instrument for Studying Color Reaction," by Kienle, Royer and McCleary, which appeared in the December issue of the **Textile Research Journal.** It may be obtained from the advertising department of the above company.

Chicago Metal Hose Corp., Maywood, Ill.—A new full-line catalogue, No. G-47, released by this company, has separate sections describing its various products. Also included is information on "Flexonics," the science of controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion, and is applied particularly to the manufacture of flexible metal hose. Sent on request on company letterhead.

The Duriron Company, Inc., Dayton 1, Ohio.—Now available from this company are three new bulletins giving information on the company's products, including information on the acids to which they are resistant. Bulletin No. 617, a two-page booklet, gives complete details on Durco corrosion-resistant top lubricated plug valves. A cutaway view of the valve shows the parts made of the corrosion-resistant high-silicon iron, and the principle of operation is explained in the text. Also included are a list of the operating features of this type of valve, illustrated parts list, and engineering and dimension data on the seven sizes of valves. Bulletin No. 1804 is an eight-page booklet with a complete description of Durco corrosion-resistant steam jets. It includes engineering information on application, installation and operation. There is a chart to be used in calculating the proper size jet and steam consumption, with complete data on sizes and capacities, dimension drawings, etc. Bulletin No. 1603 covers heat exchangers for heating and cooling corrosive solutions, and includes a drawing showing the complete unit, as well as installation photos.

The Farval Corporation, Cleveland 4, Ohio.—Just published by this company is a booklet, "Studies in Centralized Lubrication," giving case histories of Farval lubrication system installations, such as traveling cranes. Also available is Bulletin No. 25, with further information on these lubrication systems. Either circular may be had by addressing the company at 3293 E. 80th St., Cleveland 4, Ohio.

E. P. Lawson Co., Inc., 426 W. 33rd St. New York.—In a six-page, illustrated brochure released by this company is shown its new "38" paper cutter. Close-up photos are used to illustrate the new safety features. Also listed are specifications. Copies may be obtained from the company.

Northern Equipment Co., 1945 Grove Ave., Erie, Pa.—Just issued by this company are three bulletins with performance reports on Copes Water Level Controls. No. 465 covers installations at the West Reading Station, Metropolitan Edison; No. 467, at Buzzard Point Plant, Potomac Electric Power Company, and No. 469, at 12th Street, Reeves Avenue and Chesterfield Stations of Virginia Electric and Power Company. The booklets are well illustrated with photos of the controls used in these stations, as well as diagrams of other types of equipment.

Prufcoat Laboratories, Inc., 63 Main Street, Cambridge 42, Mass.—Just off the press is a catalogue folder descriptive of the protective coatings made by this company. The folder describes the features of Prufcoat, chemical agents to which it is resistant, and the uses to which it is applied, together with directions for applications.

Speed Selector Co., Inc., Cleveland, Ohio, and **B. F. Goodrich Co.,** Akron, Ohio.—Announced jointly by these companies is a broadside on the improved Variable-V-Planetary infinite ratio Speed Selector. This folder describes the construction of the Speed Selector and includes a page outlining the engineering principles of its operation, with illustrations. A page is devoted to dimensions, horsepower and torque ratings of the three models available. Among the applications for the Speed Selector are the following: agitators, conveyors, cookers, dryers, hoists, mixers, process machinery and pumps. Copies of the folder may be obtained from the B. F. Goodrich Co.

Warren Steam Pump Company, Warren, Mass.—Just issued by this company is Bulletin No. 243, descriptive of its machine and jordan chest pumps. A chart showing the 24-hour record of stock level in the regulating box of the pump, sketches of installations, and also approximate dimensions make this folder a valuable one for paper manufacturers.

BOOKS

Analysis and Design of Transistor Chains—Written by H. Ziebolz and presented as a two-volume book, this work purposes to establish a systematic approach to the classification of mechanical, hydraulic, electric and electronic and other technical devices. The study reduces all designs to basic elements and establishes methods for solving complex problems of instrumentation. Volume I incorporates the text matter of the book; while Volume II is devoted to the presentation of the correlative diagrams. Both volumes are paper-covered and spiral-bound with wire. The book is priced at $5.00 a copy by its publisher—Askania Regulator Company, 1603 South Michigan Ave., Chicago, Ill.

Concise Chemical and Technical Dictionary—Edited by H. Bennett, this volume includes definitions of about 50,000 chemical and technical terms. Among the terms covered are many trade names and abbreviations. The definitions, as indicated by the title of the book, are definitely concise. The main entries, printed in bold face type, are alphabetized as one word. Names of compounds are listed in the natural order: for example, anhydrous lanolin and not lanolin, anhydrous. Trade names and proper names begin with a capital letter. The dictionary also presents the general rules for pronunciation of chemical terms as recommended by the Nomenclature, Spelling and Pronunciation Committee of the American Chemical Society. In addition, there is a list of key words with their phonetic spellings and diacritical marks. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y., the book is priced at $10.00 a copy.

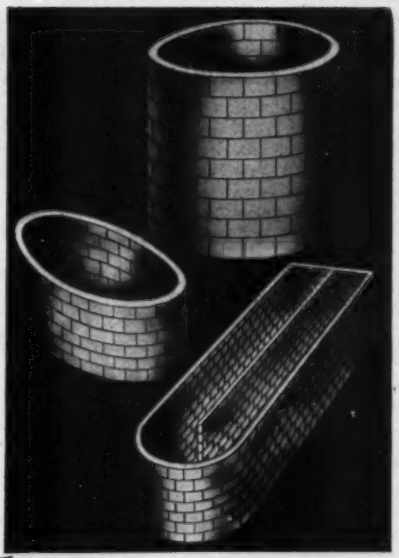
High Speed Production of Corrugated Boxes—A paper-covered brochure of 30 pages, with a page size of 8½ in. by 11 in., this publication is the work of A. W. Werner. The text covers personnel organization, grievances, lost time report, costs, man-power, plan-power, machine-power, plant layout, mechanical changes, and wage incentives. The price of the publication is $2.00 a copy domestic; $2.25 a copy foreign. Board Products Publishing Co., 228 N. La Salle St., Chicago 1, Ill., is its publisher.

Industrial Films (A Source of Occupational Information)—Fifty-one films, representing 18 industries, selected from among 175 films previewed by the United States Employment Service, are annotated in this paper-covered booklet. The major part of the publication is made up of the film descriptions and evaluations in which are included indications of the jobs most clearly shown and details on who distributes the films, rental and transportation charges, etc. There also is a list of periodicals and catalogues containing references to other industrial films. The publication is available through the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C., at 20 cents a copy.

Learning to Weld—A 32-page, paper-covered, well-illustrated booklet (page size 5½ in. by 8½ in.), this publication is an elementary text on arc welding technology and procedures. Among the subjects treated are: protective clothing and equipment; striking the arc; various welding positions; types of welds; fit-up of parts; procedures for various welds including fillets in horizontal, flat, vertical and overhead positions; butt welds; lap welds; corner and edge welds; welding cast iron; and hard surfacing. There also is a short glossary of welding terms. Published by The Lincoln Electric Company, Cleveland 1, Ohio, the price of the booklet is 25c a copy in the United States; 35c a copy elsewhere.

Scientific Instruments — Edited by Herbert J. Cooper, Head of Engineering Department, South-West Essex Technical College and School of Art, this book discusses a wide range of instruments designed for making physical measurements. Fifteen specialists, including Mr. Cooper, contributed to the volume. The text covers: Optical Instruments, Measuring Instruments, Navigational and Surveying Instruments, Liquid Testing, and Miscellaneous. These major sections are made up of 29 chapters, each of which covers some specific class of instruments. The price of the book is $6.00 a copy; the publisher, Chemical Publishing Co., Inc., 234 King Street, Brooklyn 31, New York.

ANY SIZE *or* SHAPE *of* PAPER MILL TANK *or* CHEST *can be built with*



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Complete Erection Service

KALAMAZOO TANK & SILO COMPANY

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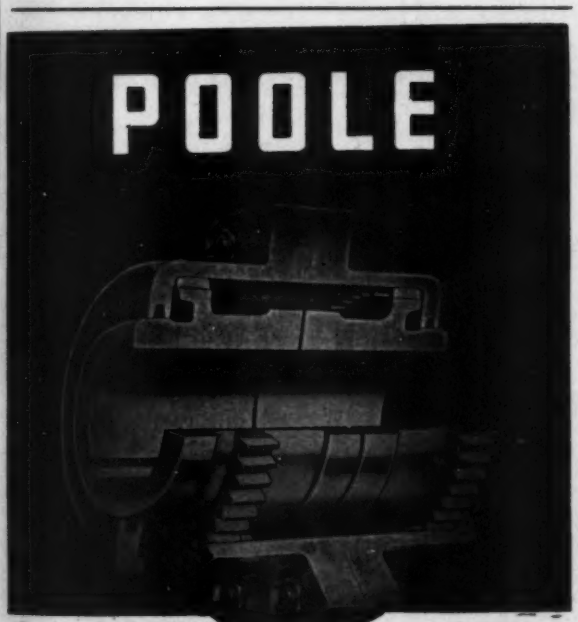


A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

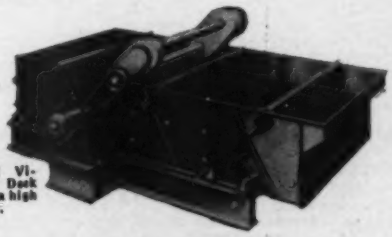
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

ASK FOR DETAILS of New...

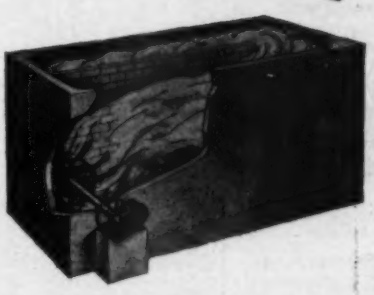
MURCO EQUIPMENT

MURCO

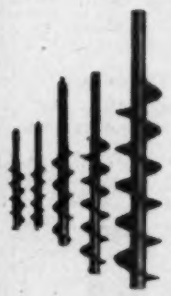
Each year there are added to our woodroom and papermill equipment items designed and made to meet that year's production conditions. Here are illustrated several of the latest MURCO designs. Complete details will be sent upon request.



MURCO Level Vibrating Double Deck Chip Screen is a high production unit.



MURCO Axial Flow Agitators — Horizontal Design. Agitator can be installed in chest from side or end to fit mill conditions.



MURCO Axial Flow Agitator for Vertical Flow Applications. Designed for chests of large diameter and small height or small diameter and great height.

MURCO Screw Conveyors and Flights. Made in stainless steel and other metals — various diameters, lengths, and pitch.

MURCO Quick Opening Gate Valve.

D. J. MURRAY MANUFACTURING CO.

WAUSAU, WISCONSIN

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Blue Overalls	5.50 to 9.00
Corduroy, Men's	5.50 to 6.00
Corduroy, Ladies'	5.25 to 5.75
Washables, No. 1	5.75 to 6.00
Percales	7.00 to 7.25
Light Prints, No. 1	6.50 to 7.00
Khaki Cuttings—	
Bleachable	6.50 to 7.00
Unbleachable	6.00 to 6.50
New White Canvas	10.00 to 10.50
New Mixed Blacks	4.50 to 5.00
Canton Flannels, Bleached	10.50 to 11.00
Shirt Cuttings—	
New White No. 1	11.00 to 11.50
White Shrunk	9.50 to 10.50
Silesias No 1	8.50 to 9.00
New Unbleached	11.50 to 12.00
Fancy	6.50 to 7.00
Linen Cuttings—	
American	9.00 to 10.00
White	15.00 to 16.00
Grey	14.00 to 15.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Roofing—	
No. 1	1.60 to 1.65
No. 2	1.50 to 1.55
No. 3 and No. 4	1.40 to 1.45
Twos and Blues—	
Repacked	3.75 to 4.25
Thirds and Blues—	
Repacked	3.50 to 4.00
Miscellaneous	2.75 to 3.00
Whites, No. 1—	
Repacked	4.75 to 5.25
Miscellaneous	4.00 to 4.50
White, No. 2—	
Repacked	3.75 to 4.25
Miscellaneous	3.25 to 3.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

(All Prices Are Nominal)

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	4.75 to 5.00
Wool Tares—	
Light	5.00 to 5.25
Heavy	5.25 to 5.50
No. 1 Scrap Bagging	4.00 to 4.50
Manila Rope—	
No. 1 large	6.50 to 6.75
No. 1 small	5.50 to 5.75
Sisal Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.50 to 6.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.75 to 6.00
No. 2 sisal	5.25 to 5.50
Soft jute	5.00 to 5.25
Mixed	2.50 to 3.00

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

(All Prices Are Nominal)

	per ton
Shavings—	
Hard White Env. Cuts	165.00—
Hard White, No. 1	130.00—
Soft White, No. 1	110.00—
Soft White, One-cut	130.00—
Soft White, Misc.	100.00—
Fly Leaf, No. 1	55.00—
Fly Leaf, Woody, No. 1	45.00—
No. 2 Mixed Col. Woody	35.00—
Flat Stock—	
No. 1 Heavy Books and Magazines	30.00 to 32.50
Mixed Books	22.00 to 24.00
Ledger Stock—	
No. 1 White	80.00 to 85.00
No. 1 Mixed (Colored)	65.00 to 70.00
Manilas—	
New Env. Cuttings	130.00 to 140.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	80.00 to 85.00
Colored Manila Tab Cards	65.00 to 70.00
Kraft—	
New Envelope Cuttings	120.00 to 125.00
Tripled Sorted No. 1 100%	70.00 to 75.00
New 100% Cor. Cuts	65.00 to 70.00
No. 1 Old Assorted	50.00 to 55.00
News—	
White Blank	70.00 to 75.00
Overissue	30.00 to 31.00
No. 1 Baled	20.00 to 21.00
Old Corrugated Containers	30.00 to 31.00
New Corrugated Cuts	37.00 to 38.00
Mill Wrappers	27.00 to 28.00
Box Board Chips	15.00 to 16.00
No. 1 Mixed Paper	17.00 to 18.00

CHEMICALS

f.o.b. shipping point

(All Prices Are Nominal)

Alum (Papermakers)—	
Lump, cwt.	4.25—
Ground, cwt.	4.00—
Powdered, cwt.	4.40—
Blanc Fixe—	
Pulp, bulk, ton	$55.00—
Dry, barrels, pound	07.50—
Bleaching Powder—	
Drums, cwt.	2.75 to 3.25
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	24.50 to 25.00
Argentine, lb.	26.00 to 27.00
China Clay—	
Domestic Filler Bulk (mine) ton	8.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	22.00 to 23.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	1.00 to 1.05
Glyc. (C.P.) drums, lb.	.40 to ——
Litharg, powd., bbl., lb.	.17 to 17½
Rosin (Gum)—	
New York, per 100 lbs.	
E	8.90—
F	9.10—
G	9.25—
WW	9.50—
Rosin (Wood), carlots	7.50—
Salt Cake—	
Dom. bulk (wks) ton	22.00 to 24.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	25.00 to ——
Soda Ash—	
Bulk (works), cwt.	1.00 to ——
Paper Bags, cwt.	1.25 to 1.35
Barrels, cwt.	1.35 to 1.60
Soda (Caustic)—	
Solid, drums, cwt.	2.50—
Ground and flake, drums, cwt.	2.90 to 3.00
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.30 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	4.67—
Pearl, barrels, cwt.	4.78—
Paper (8p.) bags, cwt.	4.78—
Powdered, barrels, cwt.	4.78—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.06½ to .07
Calcium Pig., bbls., lb.	.06½ to .07
Zinc Sulphide, bbls., lb.	10.00 to 10.25

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

(All Prices Are Nominal)

Bleached sulphite, Swedish	150.00 to 160.00
Bleached sulphite, Finnish	165.00—
Bleached sulphite, dom.	120.00 to 125.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	120.00 to 140.00
Unbleached sulphite, Fin.	132.50—
Unbleached sulphite, dom.	115.00—
Unbleached kraft, Swedish	115.00 to 140.00
Unbleached kraft, Finnish	132.50—
Unbleached kraft, northern	112 50 to 115.00
Unbleached kraft, southern	90.00 to 102.50
Bleached sulphate, Swedish	150.00 to 165.00
Bleached soda, domestic	120.00 to 125.00
Sulphite screenings, dom.	60.00 to—
Sulphate screenings, dom.	60.00 to—
Groundwood, domestic and Canadian	80.00 to 85.00

PAPER

f.o.b. New York City

(All Prices Are Nominal)

Boards—	
Binders	94.00—
Chip	90.00—
Chip, tube and can	95.00—
Chip, full blending	97.50—
Chip, sgl. mla. lined	102.50—
Coated, white patent .016	120.00—
.020 and heavier	110.00—
Kraft liner	79.00—
Filled News	92.50—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	13.30—
B Grade E. F.	—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—

Coated White (Trimmed 4 sides)

No. 1 Glossy	18.50—
No. 2 Glossy	17.25—
No. 3 Glossy	17.00—
No. 4 Glossy	—
No. 2 Offset	14.75—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—

(In Ton Lots)	per cwt.
Extra 100% Rag	48.00—
100% Rag	41.00—
75% Rag	31.50—
50% Rag	27.50—
25% Rag	24.50—

Rag Content Ledger—

(In Ton Lots)	per cwt.
Extra 100% Rag	48.00—
100% Rag	41.00—
75% Rag	32.00—
50% Rag	27.00—
25% Rag	24.00—

Sulphite Bond—

	per cwt.
Air dry, watermarked	—
No. 1 (M.F.) watermarked	15.50—
No. 2 (M.F.) watermarked	14.50—
No. 4 (M.F. watermarked	14.00—

Sulphite Ledger—

	per cwt. Zone 1
No. 1 (M.F.) watermarked	16.50—
No. 2 (M.F.) watermarked	15.50—
No. 4 (M.F.) watermarked	14.25—

Glassine (f.o.b. mill)—

	per cwt.
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof— Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—

	per ton
Rolls, Standard (Contract)	90.00—
Rolls (Spot)	(Nominal)
Sheets	109.00—

Tissues (Carlots)—

	per ream
White No. 1	1.65—
White No. 2	1.35—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manilla	1.45—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M shts.) per cs.	7.50—
Toilet, Unbleached (M. shts.) per cs.	6.00—

Towels—

	per cwts
Bleached	4.50—
Unbleached	4.00—

Wrappings (Kraft)—

	per cwt.
Super-Standard	7.00 to 7.50
No. 1 Wrapping	6.50 to 7.00
Standard Wrapping	6.25 to 6.75
Standard Bag	6.25 to 6.77
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—

	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—

Unbleached Papers—

Com. Gr' Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—

Envp. Mla., Sub. 16-40 (No. 1)	—
Envy. Mla., Sub. 16-20 (No. 2)	—
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
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Grade A-22 lb.	—

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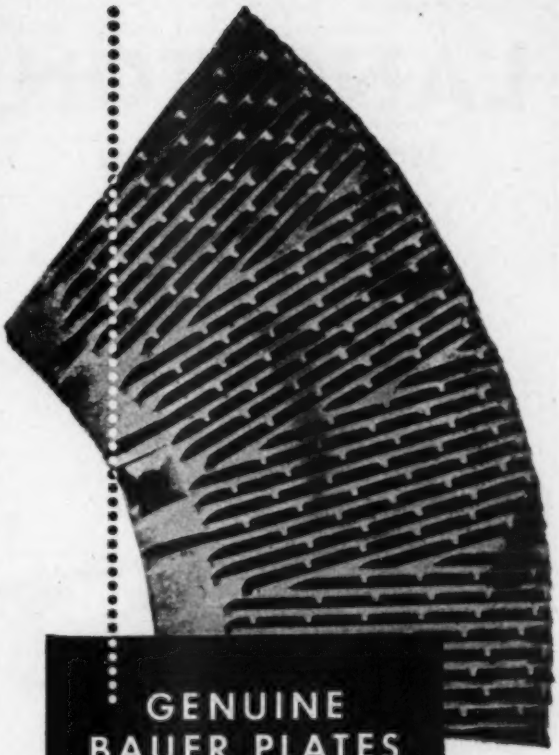

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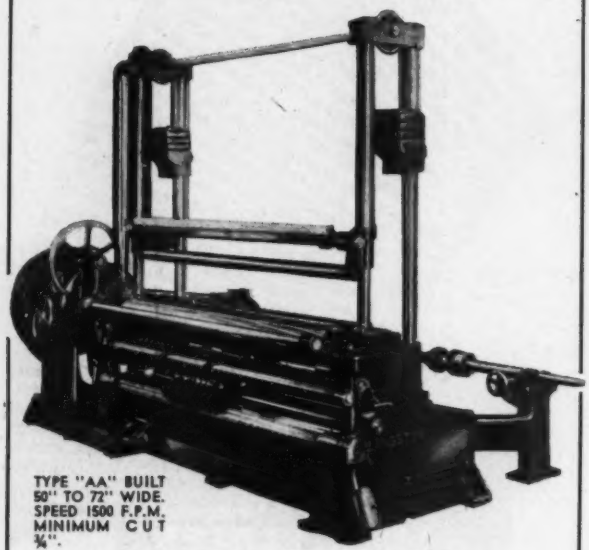

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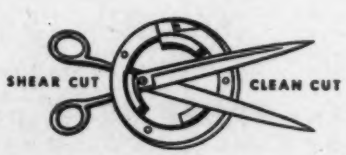

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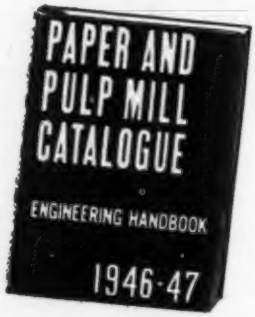

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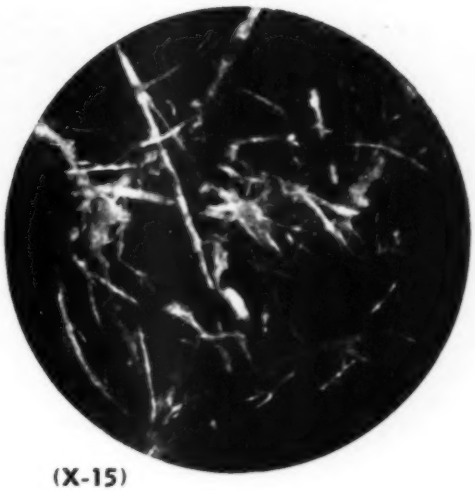

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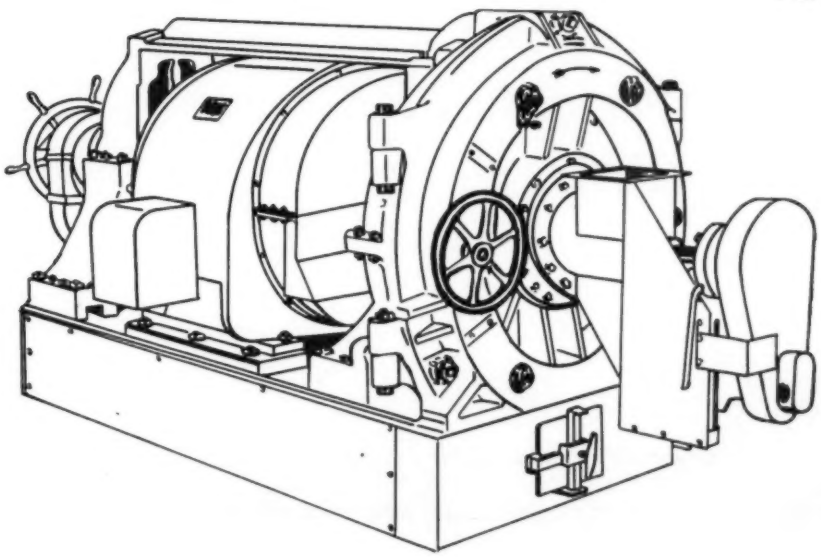

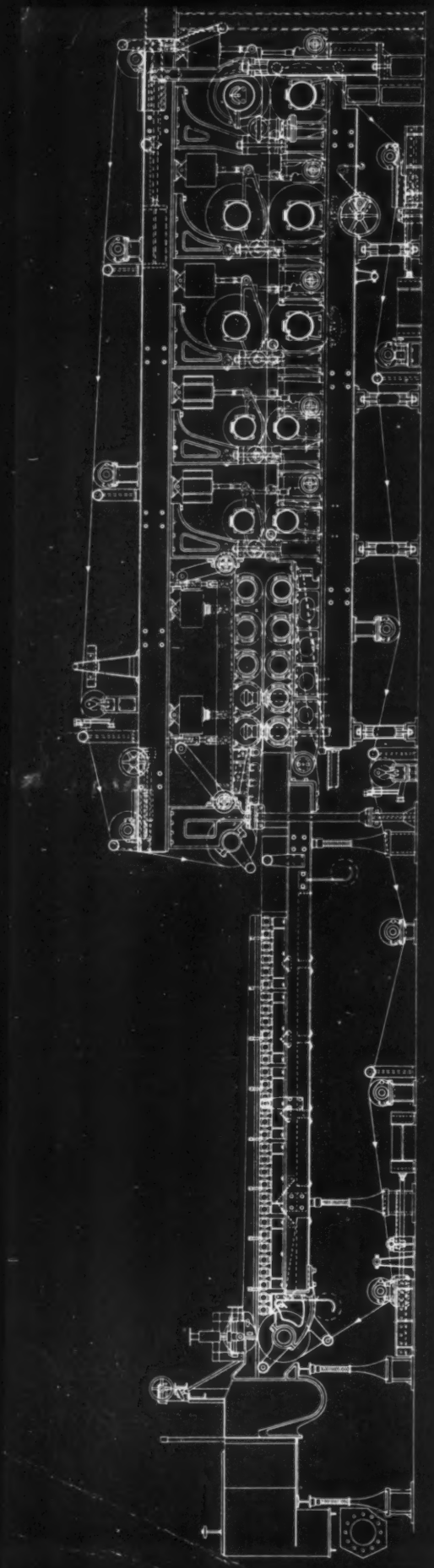

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